SunStar®

USER'S MANUAL

KM-2300 2310 Series

Direct Drive, High Speed,
1-Needle Lock Stitch Machine
with an Automatic Thread Trimmer

1) FOR AT MOST USE WITH EASINESS, PLEASE CERTAINLY READ THIS MANUAL BEFORE STARTING USE.
2) KEEP THIS MANUAL IN SAFE PLACE FOR REFERENCE WHEN THE MACHINE BREAKS DOWN.

SUNSTAR MACHINERY CO., LTD.

MME-050627

1. Thank you for purchasing our product. Based on the rich expertise and experience accumulated in industrial sewing machine production, SUNSTAR will manufacture industrial sewing machines, which deliver more diverse functions, high performance, powerful operation, enhanced durability, and more sophisticated design to meet a number of user's needs.
2. Please read this user's manual thoroughly before using the machine. Make sure to properly use the machine to enjoy its full performance.
3. The specifications of the machine are subject to change, aimed to enhance product performance, without prior notice.
4. This product is designed, manufactured, and sold as an industrial sewing machine. It should not be used for other than industrial purpose.

SUNSTAR MACHINERY CO., LTD.

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1

Machine safety regulations

Safety instructions on this manual are defined as Danger, Warning and Notice.
If you do not follow the instructoins, physical injuries and machine damages might be occurred.

Danger : This indication should be observed definitely. If not, there will be a danger during the installation, conveyance and maintenance of the machine.

Warning : When you follow this indication, injuries from the machine can be prevented.

Notice : When you follow this indication, error on the machine can be prevented.

1-1) Transporting machine Danger	Those in charge of transporting the machine should have a full understanding of the machine. The following indications should be followed when the machine is being transported. ⓐ More than 2 people must transport the machine. ⓑ To prevent accidents from occurring during transportation, wipe off the oil on the machine compeletely.
1-2) Installing machine Warning	The machine may not work properly or breakdown, if installed in certain places, Install the machine where the following qualifications agree. ⓐ Remove the package and wrappings from the top. Take special notice on the nails on the wooden boxes. ⓑ Dust and moisture stains and rusts the machine. Install an airconditioner and clean the machine regularly. ⓒ Keep the machine out of the sun. ⓓ Leave sufficient space of more than 50cm behind, and on the right and left side of the machine for repairing. ⓔ EXPLOSION HAZARDS Do not operate in explosive atmospheres. To avoid explosion, do not operate this machine in an explosive atomsphere including a place where large quantities of aerosol spray product are being used or where oxygen is being administered unless it has been specifically certified for such operation. ⓕ The machine is not provided with a local lighting due to the feature of machine. Therefore the illumination of the working area must be fulfilled by end user. [Refer] Details for machine installation are described in 4. Installation.
1-3) Repairing machine Notice	When the machine needs to be repaired, only the assigned troubleshooting engineer educated at the company should take charge. ⓐ Before cleaning or repairing the machine, turn off the main power and wait 4 minutes till the machine is completely out of power. ⓑ Not any of the machine specifications or parts should be changed without consulting the company. Such changes may make the operation dangerous. ⓒ Spare parts produced by the company should only be used for replacements. ⓓ Put all the safety covers back on the machine after the machine has been repaired.

1-4) Operating machine

Warning

KM-2300 Series is made to sew patterns on fabrics and other similar materials for industrial use.
Follow the following indications when operating the machine.

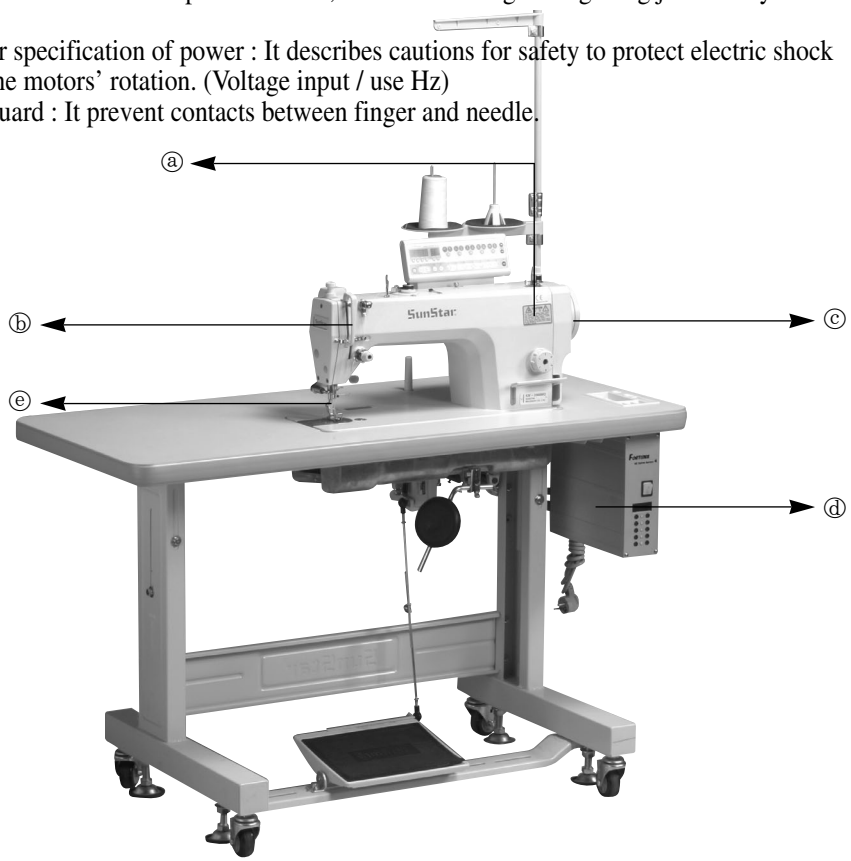
ⓐ Read through this manual carefully and completely before operating the machine.
ⓑ Wear proper clothes for work.
ⓒ Keep hands or other parts of the body away from the machine's operation parts(needle, shuttle, thread take-up lever, pulley, etc.) when the machine is operating.
ⓓ Keep the covers and finger guard on the machine during operation.
ⓔ Be sure to connect the earthing conductor.
ⓕ Turn off the main power and check if the switch is turned "off" before opening electric boxes such as the control box.
ⓖ Stop the machine before threading the needle or checking after work.
ⓗ Do not step on the pedal when turning the power on.
ⓘ If possible, install the machine away from source of strong electrical noise such as high frequency welding machines

[Warning]
Keep motor cover in place before operating, turn off power before inspecting or adjusting.

1-5) Safety devices

Notice

ⓐ Safety label : It describes cautions during the machine operation.
ⓑ Thread take-up cover : It prevents any contact between body and take-up lever.
ⓒ Motor cover : A device to prevent hands, feet and clothing from getting jammed by the motor.
ⓓ Label for specification of power : It describes cautions for safety to protect electric shock during the motors' rotation. (Voltage input / use Hz)
ⓔ Finger guard : It prevent contacts between finger and needle.



1-6) Caution mark position

Caution mark is attached on the machine for safety.
When you operate the machine, follow the directions on the mark.

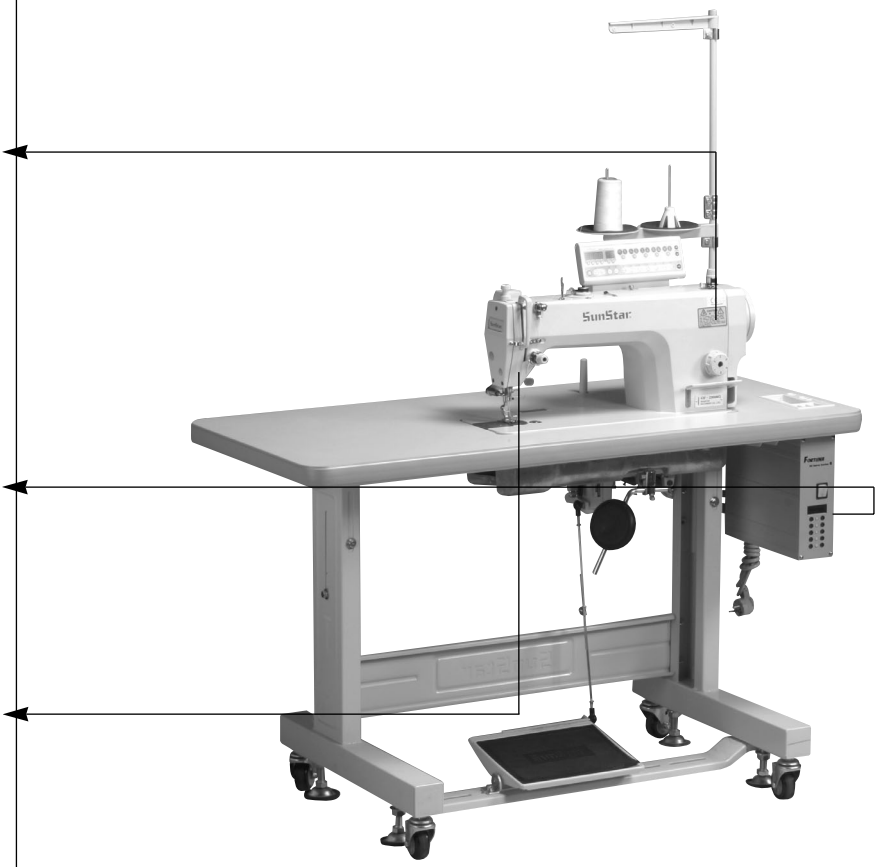
CAUTION
주 의

Do not operate without finger guard and safety devices. Before threading, changing bobbin and needle, cleaning etc. switch off main switch.
손가락 보호대와 안전장치 없이 작동하지 마십시오.
실, 보빈, 바늘교환시나 청소전에는 반드시 주전원의 스위치를 꺼 주십시오.

WARNING
경 고

Hazardous voltage will cause injury.
Be sure to wait at least 360 seconds before opening this cover after turn off main switch and unplug a power cord.
고압 전류에 의해 감전될 수 있으므로 커버를 열 때는 전원을 내리고 전원 플러그를 뽑고 나서 360초간 기다린 후 여십시오.

CAUTION
경 고



1-7)Contents of marks

Warning

Caution

1)

CAUTION
주 의

Do not operate without finger guard and safety devices. Before threading, changing bobbin and needle, cleaning etc. switch off main switch.
손가락 보호대와 안전장치 없이 작동하지 마십시오.
실, 보빈, 바늘교환시나 청소전에는 반드시 주전원의 스위치를 꺼 주십시오.

2)

WARNING
경 고

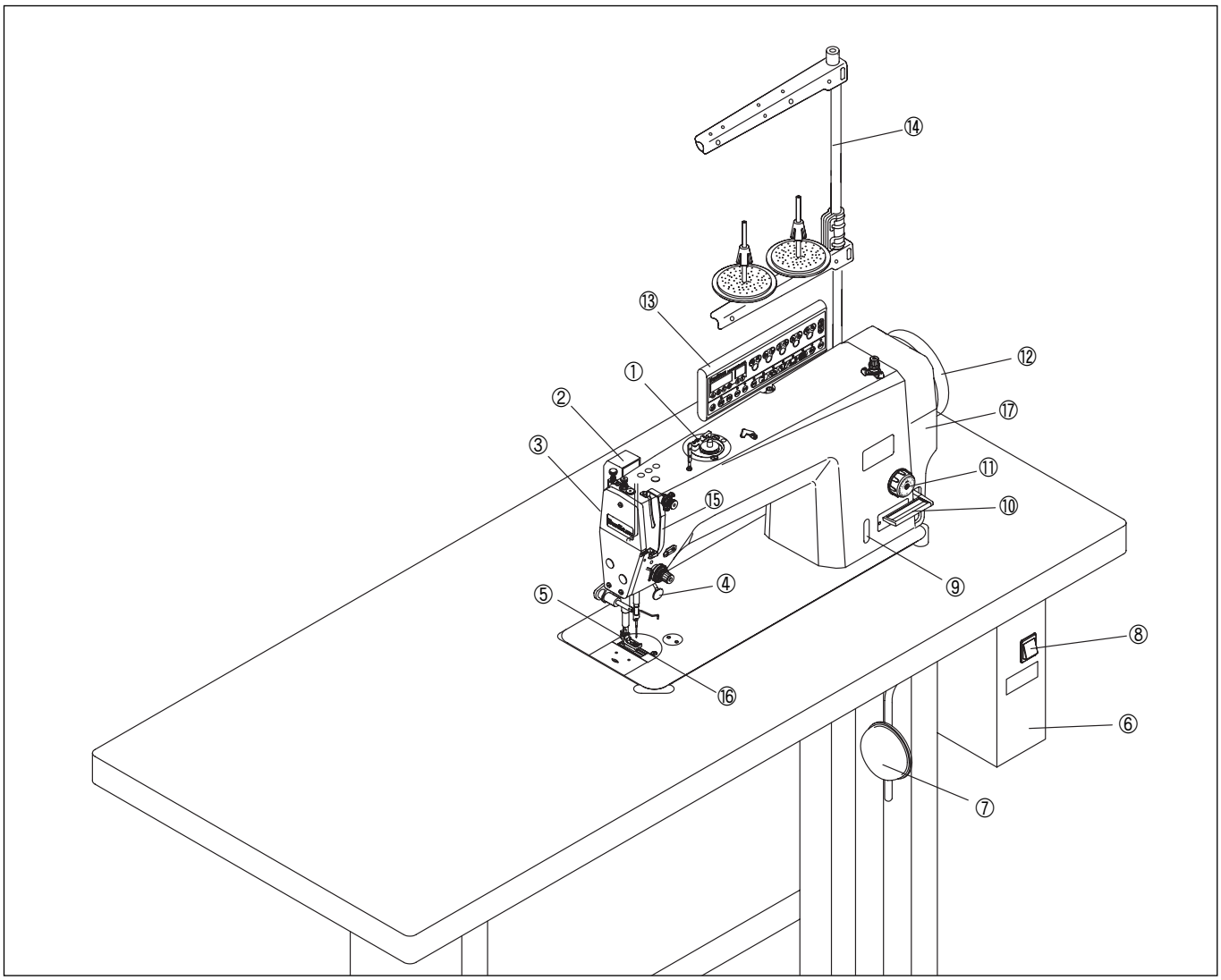
Hazardous voltage will cause injury.
Be sure to wait at least 360 seconds before opening this cover after turn off main switch and unplug a power cord.
고압 전류에 의해 감전될 수 있으므로 커버를 열 때는 전원을 내리고 전원 플러그를 뽑고 나서 360초간 기다린 후 여십시오.

3)

CAUTION
경 고

2

Names of main parts



① Bobbin winder
② Wiper
③ Presser bar lifting lever
④ Reverse button
⑤ Presser foot
⑥ Control box
⑦ Knee lifting pad

Safety Devices
⑮ Thread take-up cover
⑯ Finger guide

⑧ Power switch
⑨ Oil window
⑩ Reverse lever
⑪ Stitch length dial
⑫ Pulley
⑬ Program unit
⑭ Thread stand ass'y

⑰ Motor cover

3

Specifications

KM-2300 □ □

Code	Lubrication type
F	Full Dry(No-Lubrication Type)
S	Semi Dry(needle bar No-Lubrication Type)
M	Micro-Lubrication Type

Code	Application
A	Light materials
G	General materials
B	Heavy materials

KM-2310 □

Code	Application
G	General materials
B	Heavy materials

• The “B”(Heavy Material) code can be used at the “M”(micro oil supply)-type sewing machine only.

Model / Spec.		Full-Dry Type		Semi-Dry Type		Micro-Lubrication Type			Automatic oil supply	
		KM-2300FA	KM-2300FG	KM-2300SA	KM-2300SG	KM-2300MA	KM-2300MG	KM-2300MB	KM-2310G	KM-2310B
Application		Light materials	General materials	Light materials	General materials	Light materials	General materials	Heavy materials	General materials	Heavy materials
Lubrication		No-Lubrication		Needle Bar No-Lubrication		Micro-Lubrication Type			Automatic oil supply	
Max. Speed		3,500spm	4,000spm	4,000spm	5,000spm	4,000spm	5,000spm	4,500spm	5,000spm	4,500spm
Max. Stitch Length		4mm	5mm	4mm	5mm	4mm	5mm	5mm	5mm	
Needle Bar Stroke		29mm	30.7mm	29mm	30.7mm	29mm	30.7mm	33.4mm	30.7mm	33.4mm
Height of Feed Dog		0.75~0.85mm						1~1.2mm	0.75~0.85mm	1~1.2mm
Lift of Presser Foot	By Hand	5.5mm								
	By Knee	15mm								
	Auto	15mm (Option)								
Hook		No-Lubrication Hook (Engineering Plastic Coated Race)		Automatic Lubrication Hook						
Needle		DB×1 SF(KN)#11 #9~#11	DB×1#14 #11~#18	DB×1 SF(KN)#11 #9~#11	DB×1#14 #11~#18	DB×1 SF(KN)#11 #9~#11	DB×1#14 #11~#18	DB×1#21 #19~#23	DB×1#14 #11~#18	DB×1#21 #19~#23
Working Space		300mm								
Bed Size		517mm × 178mm								
Bobbin Winder		Built-in the Machine Head								
Main Motor		500W Direct Drive AC Servo Motor								
Automatic BackTack Device		Provided								
Automatic Thread Trimmer		Provided								
Thread Wiper		Provided								
Power		1-phase: 100~240V, 3-phase: 200~240V 50Hz/60Hz								

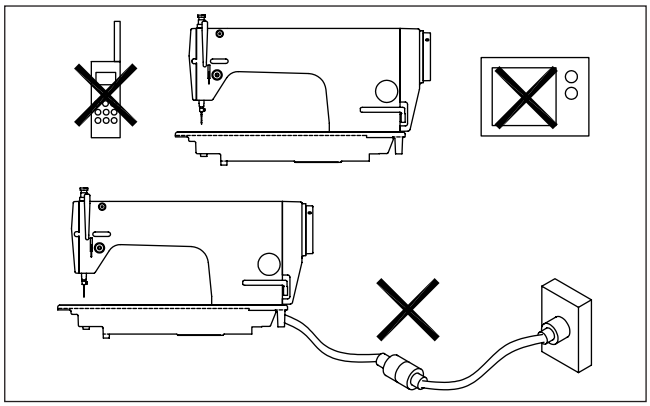
4

Installation

[Caution]

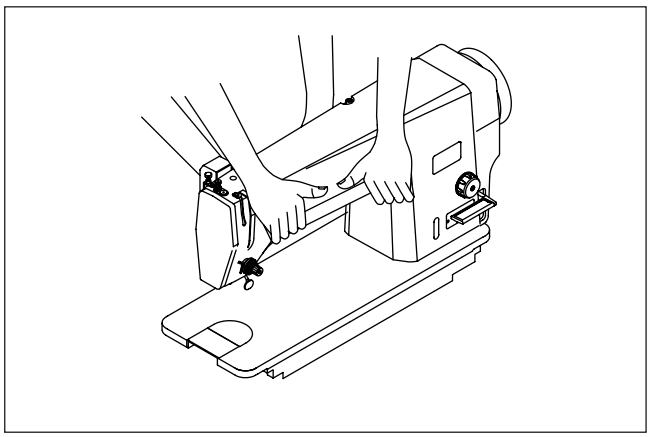
- Only trained technicians should install and wire up the machine.
- The machine weighs over 50 kg. More than two persons should install the machine.
- Do not plug in the machine until installation is completed.
  If the operator mistakenly steps down on the pedal with the plug in, the machine will start automatically and can cause physical injuries.
- Use both hands when bending the machine backwards or returning it to the original position. Using only one hand can lead to severe hand injuries due to the weight of the machine.

1. Installation place
   1) Do not install the machine near television, radio or telephone; or the operation of machine can be interfered with by the noise from the appliances.
   2) Connect the ground (earth) wire. An unstable connection may result in malfunction



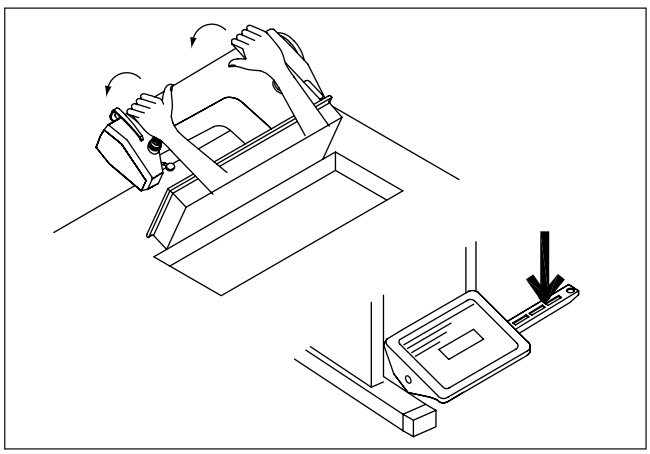
[Figure 1]

2. Machine delivery
   1) There should be two people to move the machine, as in the Figure.



[Figure 2]

3. Bending the machine backwards
   1) Bend the machine backwards with two hands grabbing upper part of the body. Make sure to press the lower part of the board leg of the machine, or the whole body of machine falls backwards, leading to physical injuries.

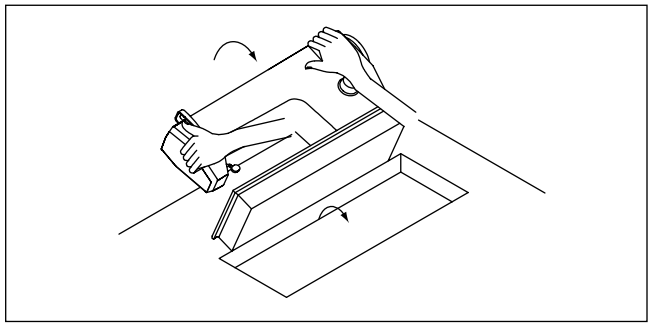


[Figure 3]

4. Return the machine to its original position

1) Clear the table of tools.

2) With the right hand, return the machine to its original position, while grabbing sideboard with the left hand.

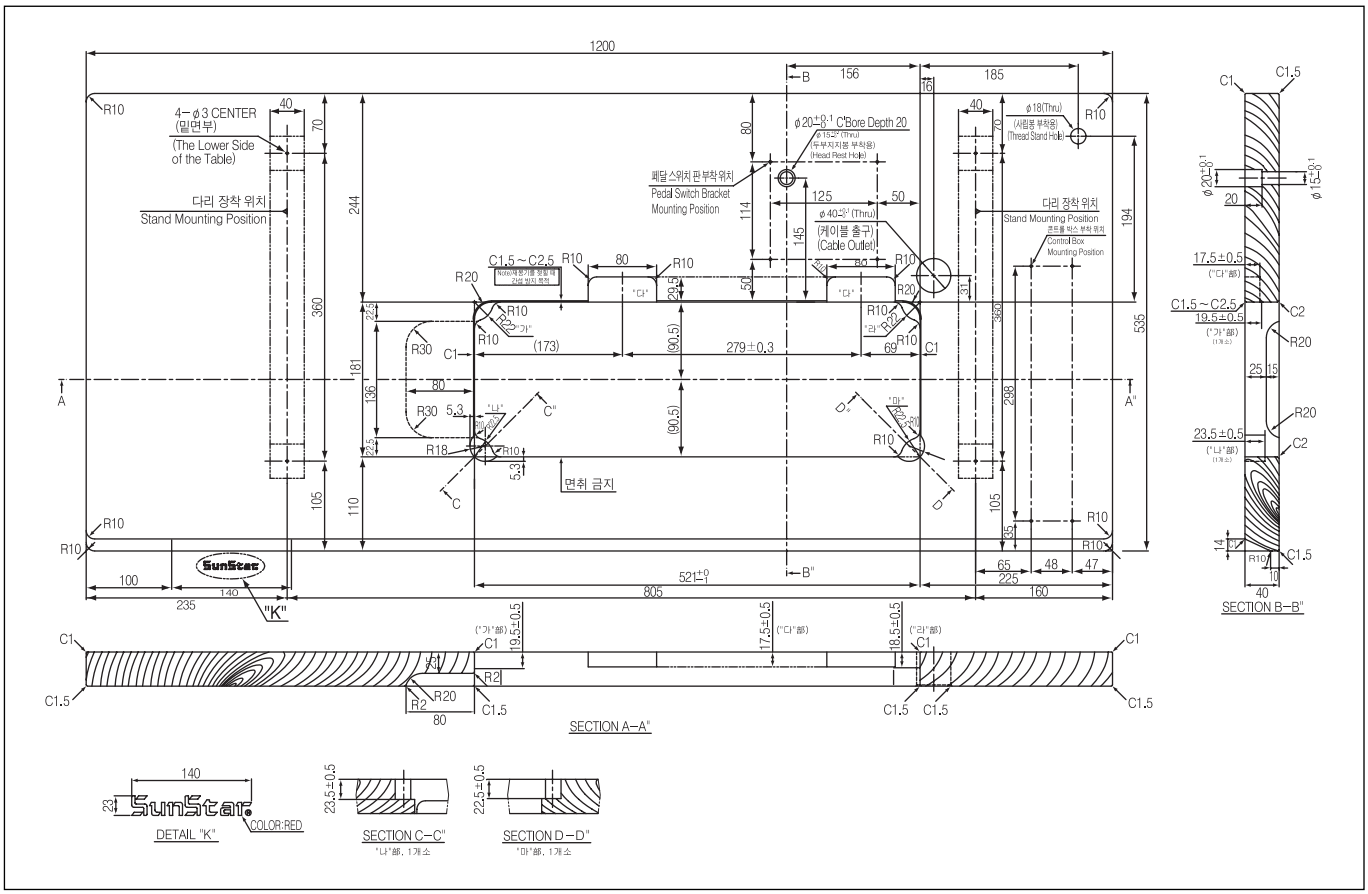


[Figure 4]

4-1. Table drawing

Please use the table provided by Sunstar. When using self-made table , the thick of table should be more than 40mm. Please use table strong enough to sustain the weight of the machine.

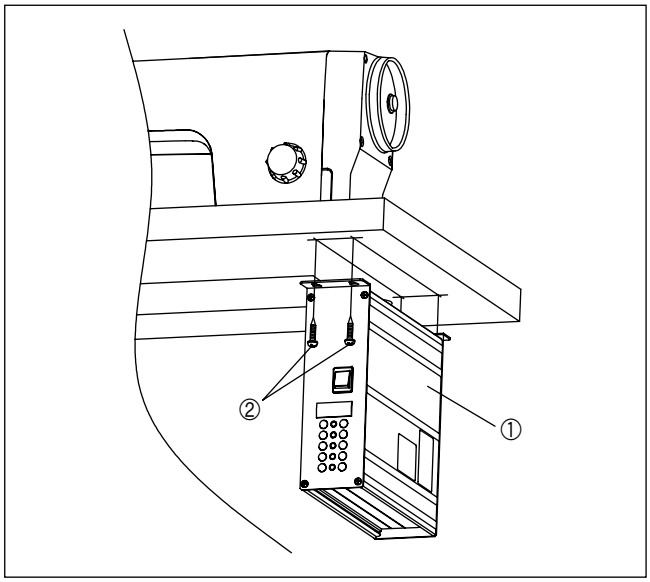
1. Table Drawing



[Figure 5]

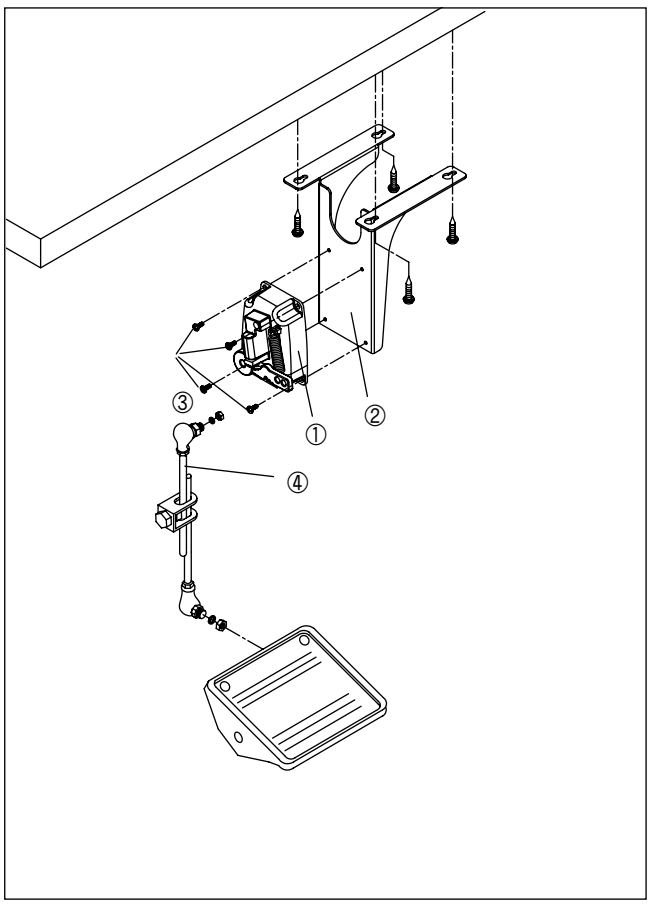
4-2. Installing machine body

1. Control box
   1) As in the Figure, attach control box ① to the lower part of table with four bolts ②.



[Figure 6]

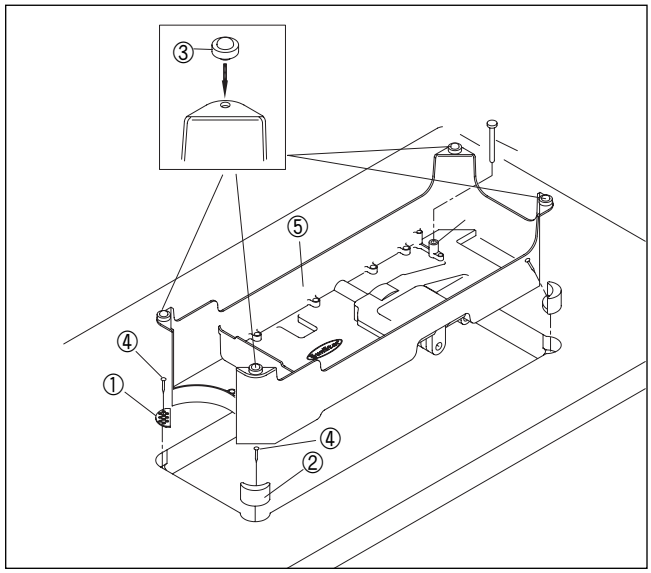
2. Pedal switch and connecting rod
   1) Attach pedal switch ① to pedal switch bracket ② with four bolts ③.
   2) As in the Figure, attach pedal switch bracket ② to the lower part of table.
   3) Connect one end of the connecting rod ④ with pedal switch and the other end with pedal, and then adjust length of the rod.



[Figure 7]

3. Oil Pan

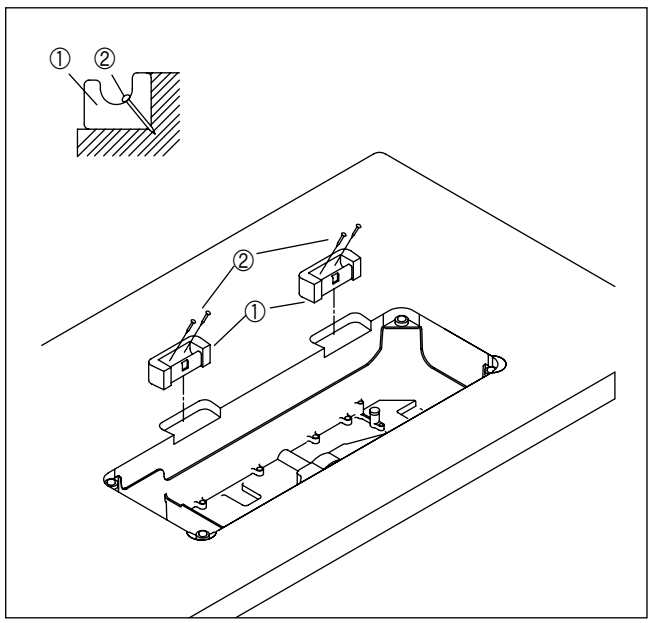
1) Fix two head hinge rubber (B) ① to the rear side of table with nails ④.
2) Fix two head hinge rubber (A) ② to the front side of table with nails ④.
3) Insert four head hinge rubber (c) ③ into four holes of oil pan⑤.
4) Place safely oil pan ⑤ assembled with cushion rubbers into the rectangular hole on the table.
5) Insert knee lifting support cap ⑥ into oil pan's projecting hole ⑦ as in the figure.



[Figure 8]

4. Hinge Rubber

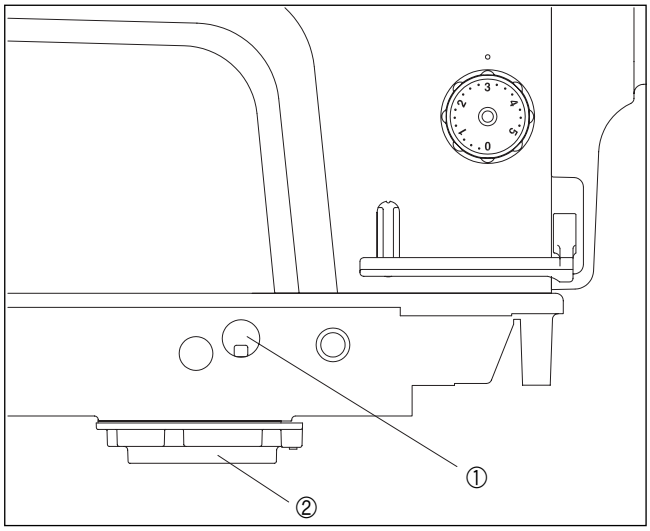
1) As in the figure, assemble two-hinge rubbers ① on the table.
2) As in the figure, fix the hinge rubbers with nails ②.



[Figure 9]

5. Deflation Bushing cap

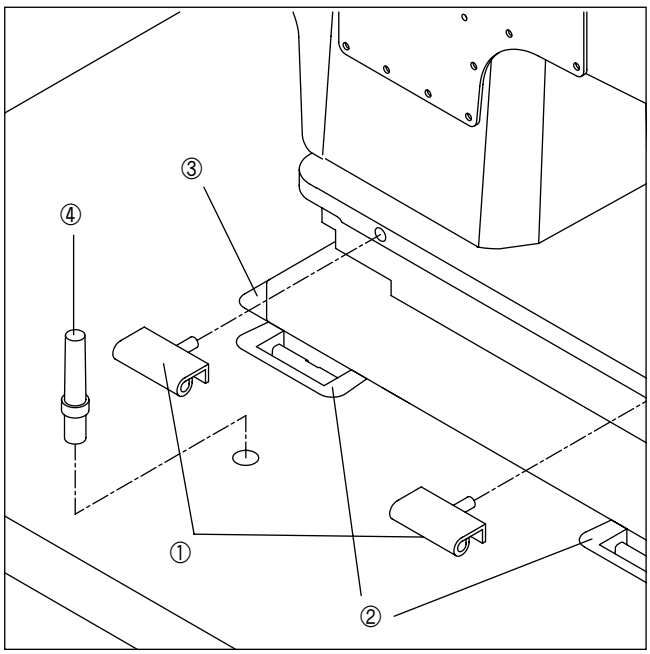
1) Remove deflation-bushing cap①.
2) If deflation-bushing cap① is not removed, oil may spill from gearbox cover②.



[Figure 10]

6. Machine body

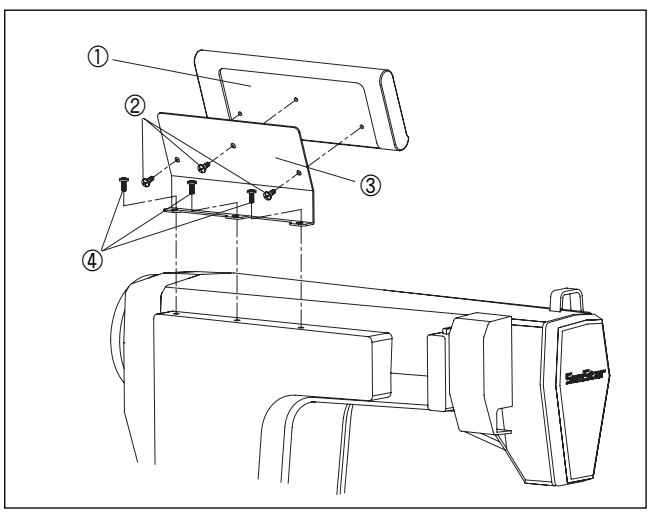
1) Insert two hinges ① firmly into the holes of the rear side of machine bed.
2) Put machine body on the rubber cushion ③, while putting hinges ① on the hinge bed rubber ② safe and sound.
3) Insert the machine body sustaining pole ④ into table completely. If the pole is not inserted completely, that may cause accidents because the pole cannot sustain the weight of machine body firmly, when the body bent backwards.



[Figure 11]

7. Program Unit

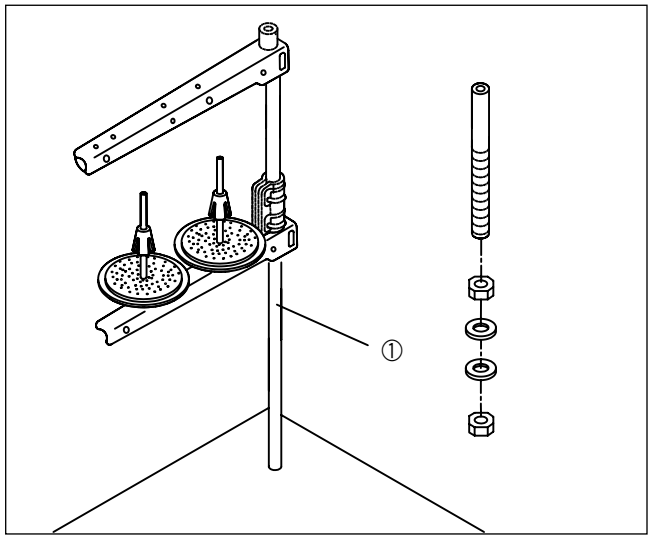
1) As in the Figure, combine program unit ① to bracket ③ with three screws ②.
2) Attach the combined bracket ③ to the upper part of machine body with three screws ④.



[Figure 12]

8. Thread stand

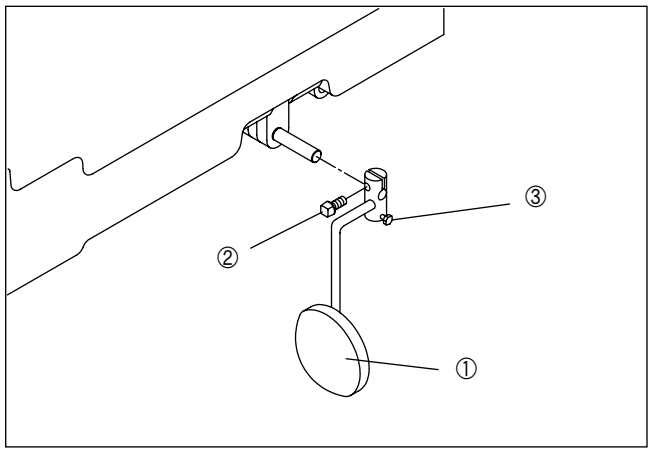
1) As in the Figure, fix the thread stand① to table.



[Figure 13]

9. Knee Lifter Pad

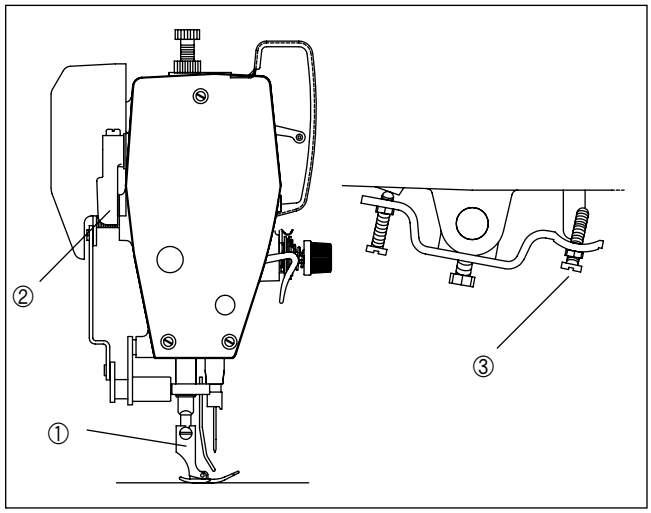
1) As in the figure, attach knee lifter pad① to the lower part of oil pan. And then fix it with bolt②.
2) Loosen bolt③ to adjust position of knee lifter pad①.



[Figure 14]

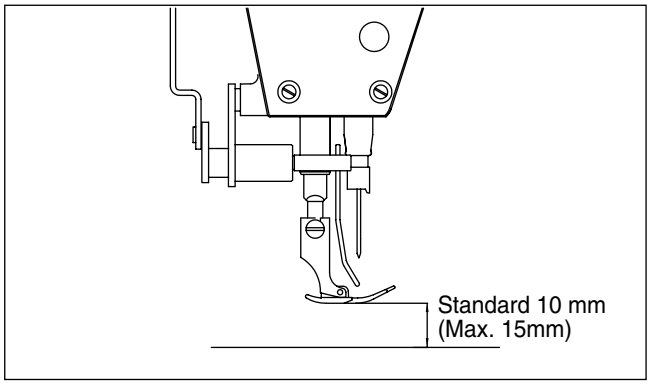
10. Adjusting height of Presser Foot

1) Turn pulley to place feed dog in the lower part of needle plate.
2) When presser foot① is up, make presser foot① down by lowering presser bar lifting lever②.
3) Adjust the position of presser foot① by using screw③.



[Figure 15]

4) The standard height is 10mm. Maximum height is 15mm.



[Figure 16]

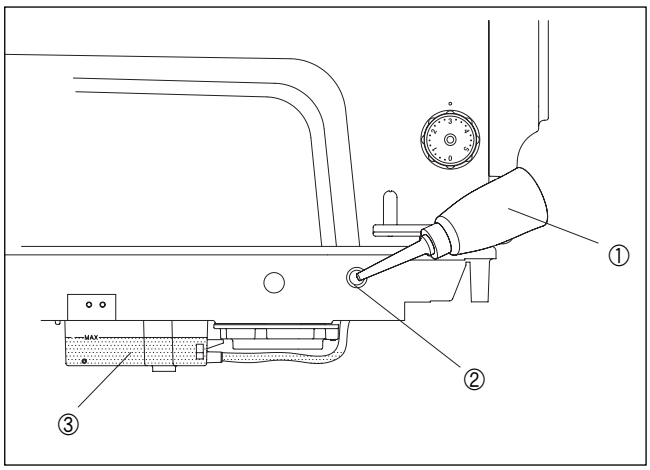
4-3. Supplying oil

[Caution]

- Plug in only after oil supply is finished. If the operator mistakenly steps on the pedal with the plug in, the machine will start automatically and can cause severe injuries.
- When handling lubricants, wear protective glasses or gloves to prevent lubricants from contacting with your eyes or skin. Wash your hands in running water with soap when they are smeared with lubricant. If lubricant is in the eye, instantly wash it with running water and see a doctor.
- Never drink lubricants since they can cause vomiting or diarrhoea. Go to see a doctor, if you mistakenly drink lubricant.
- Keep the oil out of the reach of children. Keep the oil away from heat.

- Operate the machine only after supplying oil when the machine is used for the first time or has been left unused for a long time.
- Only use genuine lubricant of this company. (Lubricant is in the accessory box.)

1. Turn over sewing machine, seperates oil holes ② and rubber cap. Use the oil can ① inthe accessory box to supply lubricant into the oil holes②.
   ※ Make sure not to pour the whole lubricant.
   Pour oil to Max position of lubrication tank③.



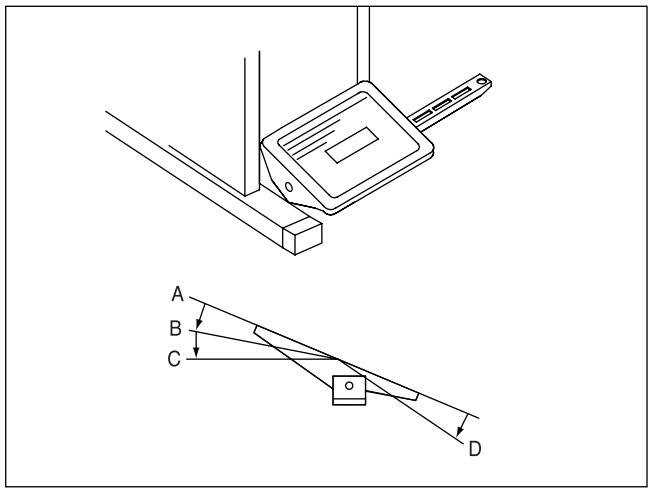
[Figure 17]

4-4. Trial run (Pedal operation)

[Caution]

· Make sure not to touch or press down parts that are operating or moving during operation. Failure to follow the safety rules may result in physical injuries or mechanical damages.

1. Press pedal lightly to the position of B to check if the machine is operating low-speed sewing.
2. Press pedal to the position of C to check if the machine is operating high-speed sewing.
3. Press pedal backward and forward. And then put the pedal at neutral position of A to check if needle stops lower than the upper surface of needle plate.(in case that needle down stop is set)
4. When pressing pedal to the position of D(or pressing pedal the position of to D and then replacing pedal to the position of A), needle will stop higher than the upper surface of needle plate after trimming.



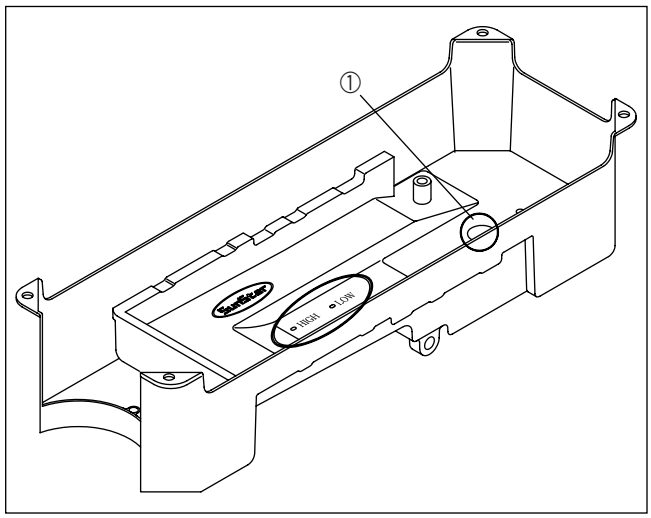
[Figure 18]

4-5. Installation (KM-2310 Series)

1. Installing magnet for chip (metal powder) removal
   1) Take out the magnet for chip (metal powder) removal from the accessory box and attach it to ① inside the oil fan.

   ※ If the sewing machine is operated without the magnet, it may cause abnormalities in the sewing machine. Use of the magnet can improve machine durability.

2. Lubricant supply to oil fan
   1) Fill the oil fan with lubricant up to the "HIGH" mark.
   2) Use either the oil for SunStar industrial sewing machines or Shell's Tellus C10 as lubricant.
   3) When the lubricant level falls to "Low", the oil fan shall be refilled with lubricant until it reaches the "HIGH" mark again.
   4) Replace lubricant every two weeks.



[Figure 19]

5

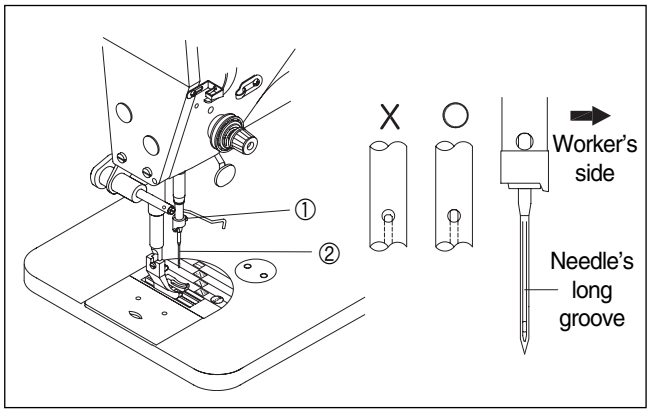
Preparations for sewing

5-1. Installing needle

[Caution]

· Always turn off the power when mounting a needle.
If the operator mistakenly steps on the pedal while the power is on, the machine will start automatically and can result in physical injuries.

1. Turn the pulley of machine to raise needle bar to its highest position.
2. Unfasten the fixing screw ①.
3. As in the figure, insert needle ② straight to the end with the needle's long groove facing left and fasten the fixing screw ① firmly.



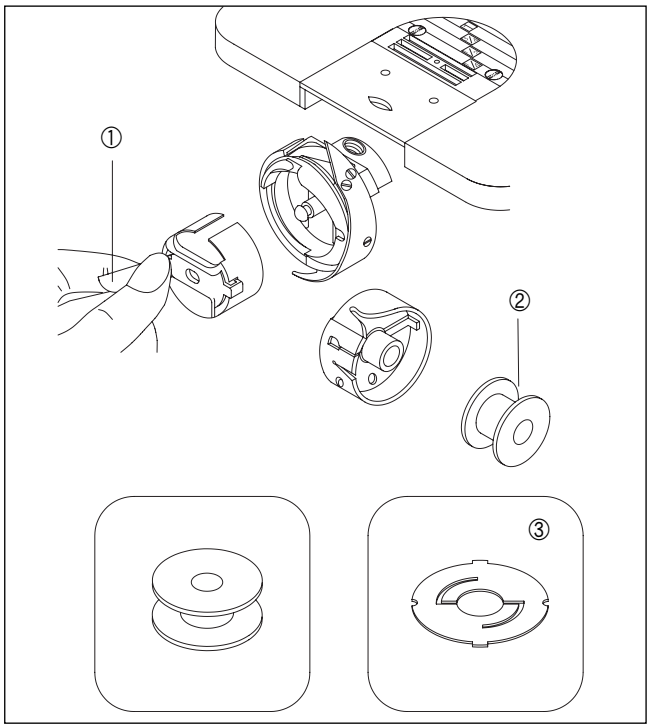
[Figure 20]

5-2. Removing bobbin case

[Caution]

· Always turn off the power when removing a bobbin case.
If the operator mistakenly steps on the pedal while the power is on, the machine will start automatically and can result in physical injuries.

1. Place needle at the upper part of needle plate by turning pulley.
2. Remove bobbin case by pulling bobbin case holder ①.
3. Let go of the holder ① to remove bobbin ②.
4. The spring ③ inside bobbin case is designed to prevent bobbin from spinning idly during trimming.



[Figure 21]

5-3. Winding lower thread

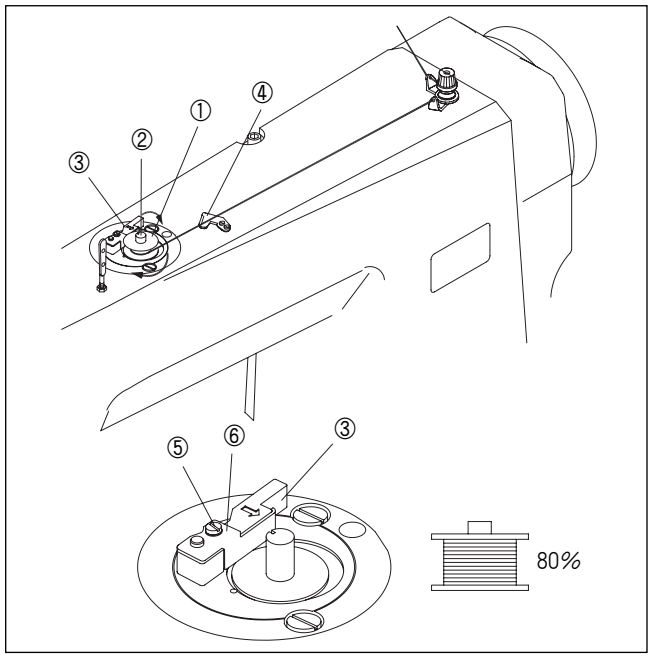
[Caution]

· Make sure not to touch or press down parts that are operating or moving during thread winding. Failure to follow the safety rules may result in physical injuries or mechanical damages.

1. Turn on the power switch.
2. Insert bobbin① into bobbin winder shaft②.
3. Wind thread on bobbin① several times in the arrow direction.
4. Push bobbin lever③ in the direction of bobbin.
5. Raise presser bar with presser bar lifter.
6. When pressing pedal, the machine starts to operate and thread winds on bobbin.
7. When thread winding is done, bobbin lever③ returns automatically.
8. Remove bobbin and cut thread with bobbin winder knife④.
   ※ To adjust the amount of bobbin winding, loosen screw⑤ and adjust bobbin winder adjusting plate③.

[Caution]

Make sure that thread should be regulated to wind 80% of bobbin capacity.



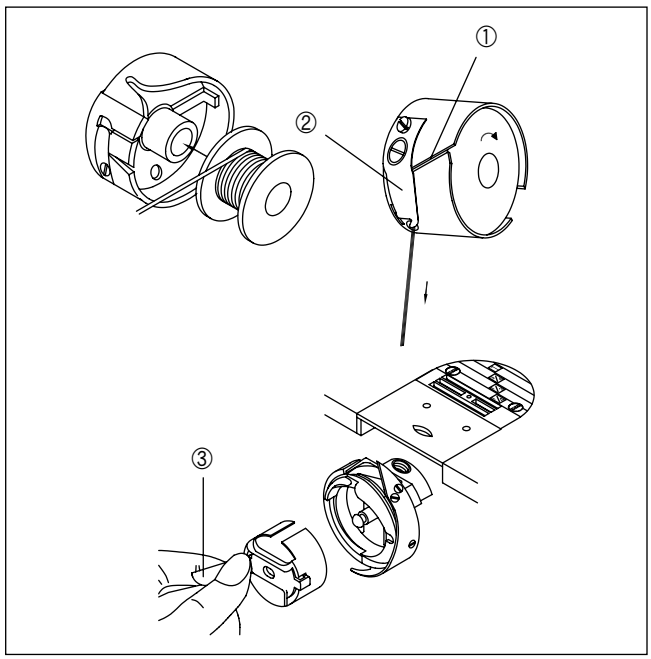
[Figure 22]

5-4. Installing bobbin case

[Caution]

· When installing bobbin case, make sure to turn off the power. Pressing pedal by mistake may result in physical injuries or mechanical damages.

1. Turn pulley to place needle at the upper part of needle plate.
2. Wind thread on bobbin to the right and insert it into bobbin case.
3. Pass thread through groove① and then pass it through the lower part of tension spring②.
4. Pull thread out of the thread hole at the end of tension spring ②.
5. Pull thread to make sure that bobbin moves to the right as in the figure.
6. After pulling the holder of bobbin case③, install bobbin case into hook.



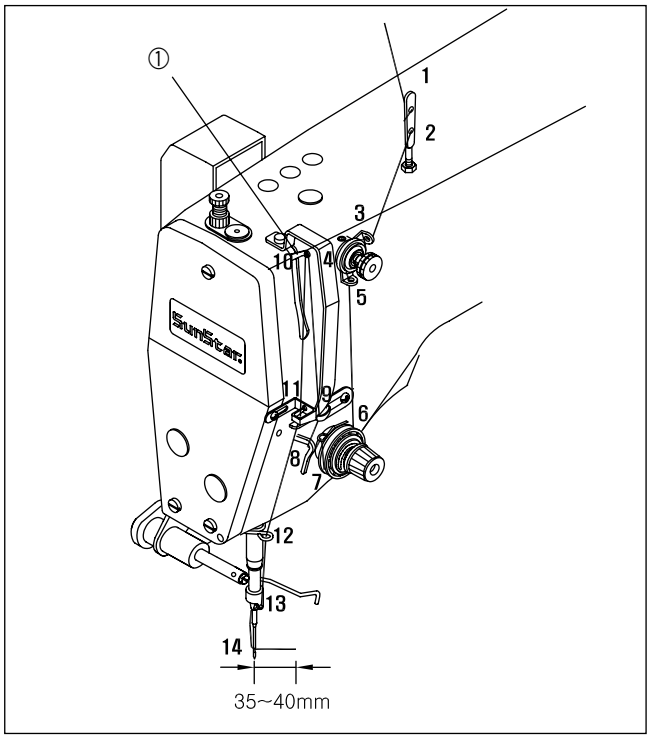
[Figure 23]

5-5. Inserting upper thread

[Caution]

· Always turn off the power when inserting upper thread.
If the operator mistakenly steps on the pedal while the power is on, the machine will start automatically and can result in physical injuries.

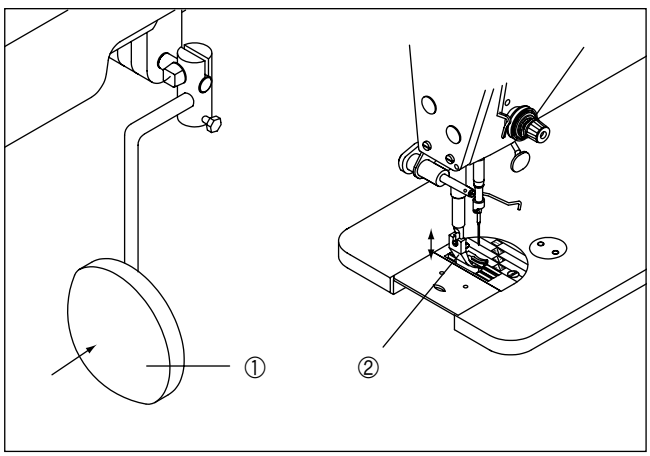
1. Place the thread take-up ① at its the highest position by turning pulley before inserting the upper thread, so that it becomes easy to insert it and prevent it from falling out when the machine starts to operate.
2. The adequate length of upper thread extending from the needle hole is 35 ~ 40mm.



[Figure 24]

5-6. Using knee lifer pad

1. Pressing knee lifter pad① to the right will move presser foot ② up and down.



[Figure 25]

6

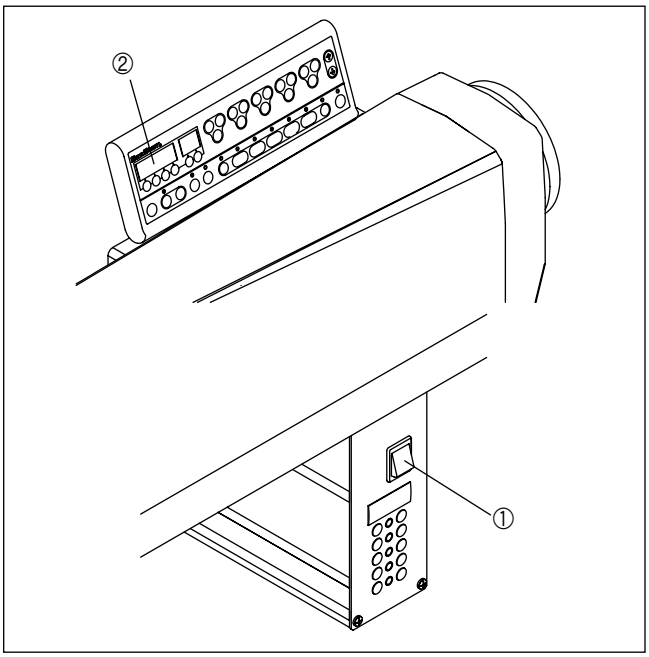
Sewing

[Caution]

- Wear protective gears for safety. Operation without them may lead to physical injuries.
- Turn off the machine in the following situations.
  If the operator mistakenly steps on the pedal with the plug in, the machine will start automatically and can cause severe injuries.
  - When inserting upper thread
  - When replacing bobbin or needle
  - When the machine not in use or the operator leaving the work place.

6-1. Sewing

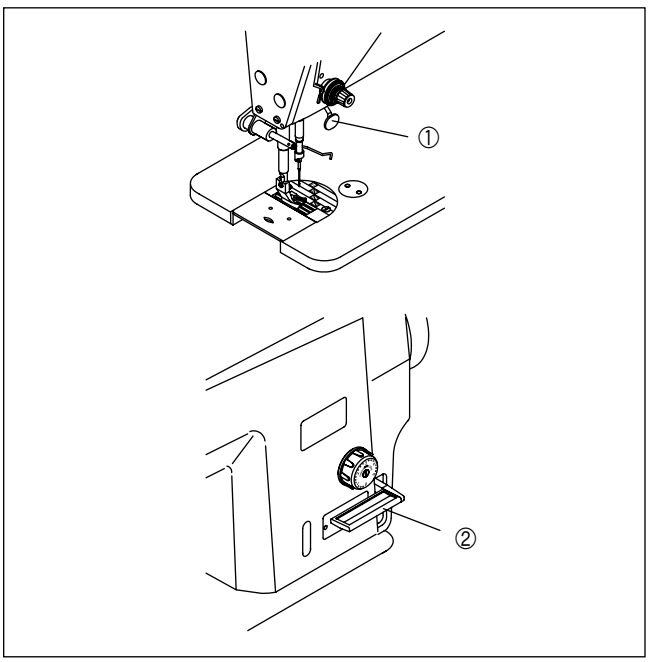
1. Press ON button of power switch ①.
2. Lamp on the program unit ② turns on and machine is ready to operate.
3. Control sewing conditions by using program unit ②.
   (See user's manual of Fortuna IV.)
4. Step on the pedal to operate.



[Figure 26]

6-2. Back tack (reverse) sewing

1. Pressing the reverse switch ① or reverse lever ② will move sewing material backward. Sewing material will go forward if either of them is not being pressed.



[Figure 27]

6-3. Adjusting thread tension

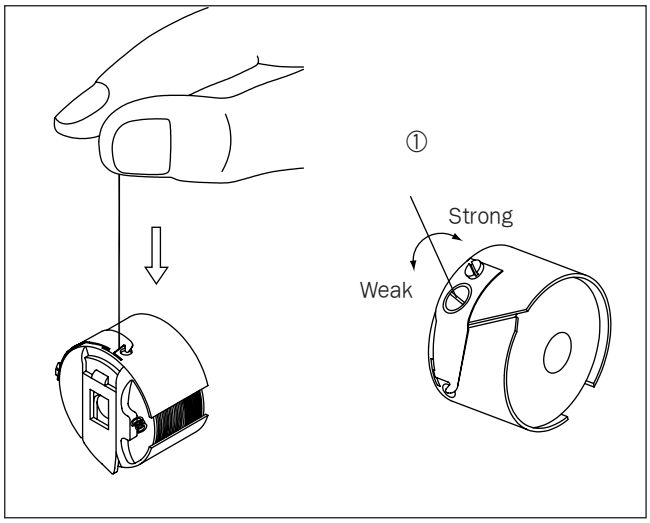
[Caution]

· When inserting and removing bobbin case, make sure to turn off the power switch. Pressing pedal by mistake may result in physical injuries or mechanical damages.

Sewing Type	Cause	Troubleshooting
	Good sewing in balance	
	Upper thread tension is too weak Lower thread tension is too strong	Make upper thread tension strong or make lower thread tension weak
	Upper thread tension is too strong Lower thread tension is too weak	Make upper thread tension weak or make lower thread tension strong

6-3-1. Lower thread tension

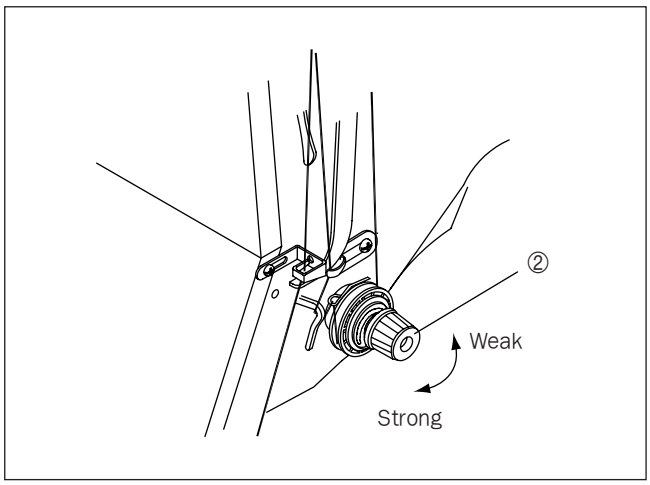
1. Adjust tension by turning tension control screw① to the extent that bobbin case falls by gravity when holding the end of thread.



[Figure 28]

6-3-2. Upper thread tension

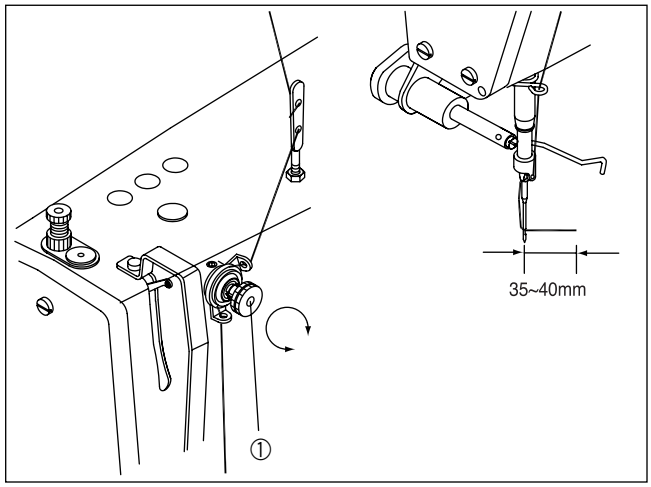
1. Adjust upper thread tension after adjusting lower thread tension to make sure good sewing.
2. Move presser foot down.
3. Adjust upper thread tension by turning tension-adjusting screw② of main thread controller.



[Figure 29]

6-4. Adjusting upper thread length after trimming

1. During the trimming process, main thread release tension is not created but only auxiliary thread release ① tension is created.
2. The adequate length of upper thread after trimming is 35 ~ 40mm.
3. Increasing auxiliary thread release ① tension will make upper thread after trimming short and decreasing the tension will make it long.



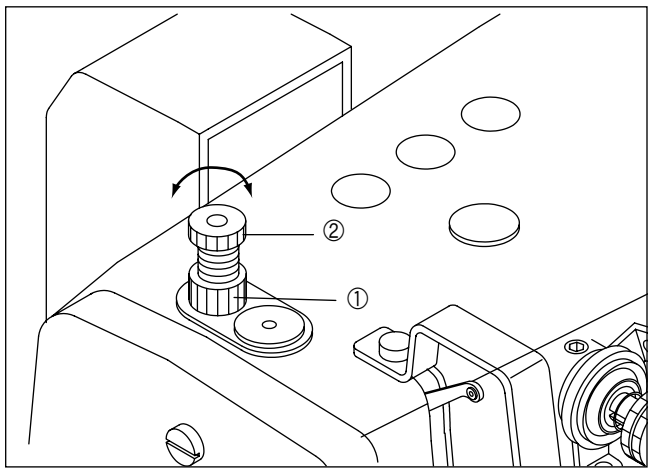
[Figure 30]

6-5. Adjusting presser foot pressure

Sewing style	Causes	Corrective action
	Good sewing in balance	
	A stitch is skipped Stitch lengths are not uniform	Increase pressure
	Puckering	Decrease pressure

6-5-1 Presser foot pressure

1. Make the presser foot pressure as weak as possible.
   (But as weak as for sewing material not to slide.)
2. Unfasten the pressure adjusting nut ①.
3. Turn the pressure adjusting screw ② to adjust presser foot pressure.
4. Fasten the pressure adjusting nut ①.



[Figure 31]

7

Inspecting and checking

To maintain proper performance of machine and use it for a long time, clean machine regularly according to the following way. Evan when machine is not in use for a long time, clean according to the following way before using the sewing machine.

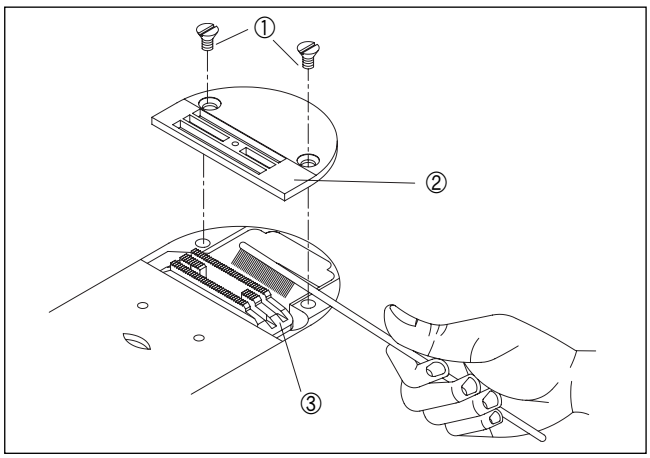
[Caution]

- Turn off the power switch before operation.
  Pressing pedal by mistake may operate machine and result in injuries.
- When handling lubricants, wear protective glasses or gloves to prevent lubricant from contacting with your eyes or skin. Wash your hands in running water with soap when they are smeared with lubricant. If lubricant is in the eye, instantly wash it with running water and see a doctor.
- Never drink lubricants since they can cause vomiting or diarrhea. Go to see a doctor, if you mistakenly drink lubricant.
- Keep the oil out of the reach of children. Keep the oil away from heat.
- Use both hands when bending the machine backwards or returning it to the original position. Using only one hand can lead to severe hand injuries due to the weight of the machine.

7-1. Daily cleaning

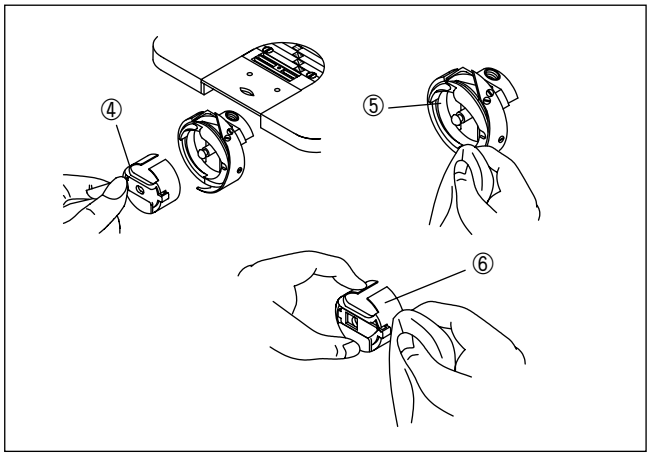
7-1-1. Cleaning

1. Raise presser foot.
2. Loosen two screws① and disassemble needle plate②.
3. Remove dust in feed dog③ with a soft brush.
4. Install needle plate② with two screws①.



[Figure 32]

5. After bending the machine backward, turn pulley to place needle at the upper part of needle plate.
6. Remove bobbin case④.
7. Remove dust in hook⑤ with a soft cloth. And then, check if hook is damaged.
8. After removing bobbin from bobbin case⑥, clean bobbin case⑥ with a cloth.
9. After inserting bobbin into bobbin case⑥, install bobbin case⑥ in the machine.



[Figure 33]

7-1-2. Supplying oil

7-1-2-1. Oil flow in gear box

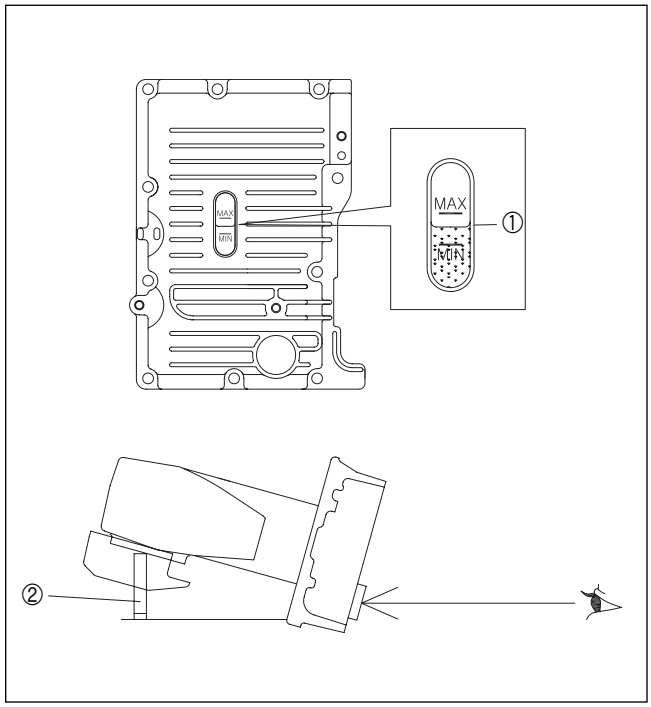
[Caution]

- Bend the machine body backward to check the oil flow in the gear box.
- Since the height of oil in the oil window ① on the gear box cover depends on the degrees at which the machine is bent, bend the machine body backward with the body sustaining pole installed correctly (See 4-2 7. Machine body).

[Check the oil flow]

- It is standard that the oil surface is in the middle of "MAX" and "MIN" carved lines on the oil window on the gear box cover ①. (Upon shipment, about 150ml lubricant is in the gear box.)

1. Check from the front the oil flow in the oil window ① on the gear box cover.
2. If the oil surface is lower than the "MIN" carved line, supply oil in the following orders.



[Figure 34]

[Supplying Oil]

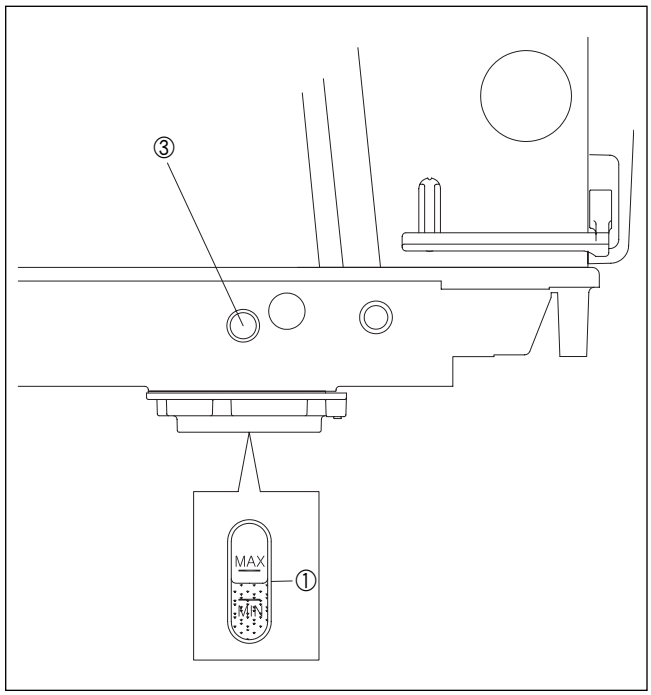
Always use genuine lubricant of SunStar.
(Lubricant is in the accessory box of the machine.)

1. Disassemble the air exhaust rubber cap ③.
2. Pour lubricant so that oil surface is in the middle of "MAX" and "MIN" carved lines on the oil window on the gear box cover ①. Be careful not to make lubricant overflow.

[Caution]

- Make sure that lubricant is not over the "MAX" carved line, or that can cause an oil leakage.

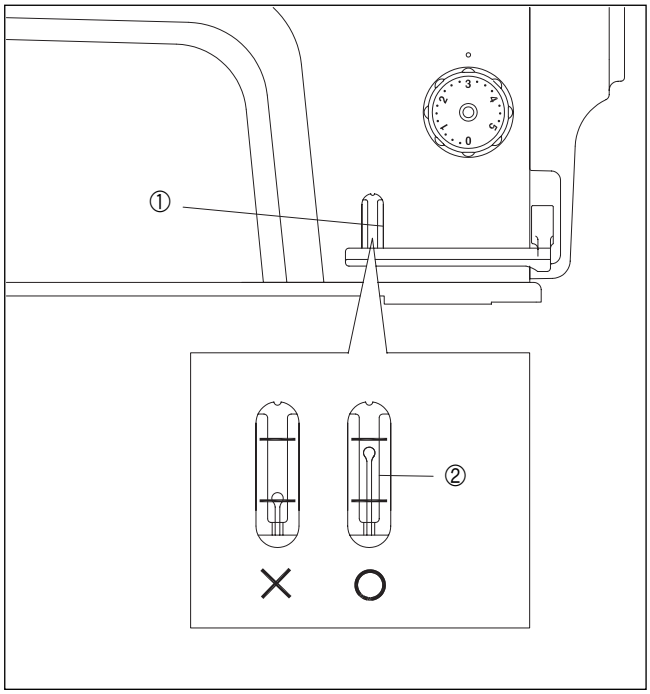
3. Assemble the rubber cap ③ and push it down completely.



[Figure 35]

7-1-2-2. Oil flow in oil tank (KM-2300M□ & S□ Type)

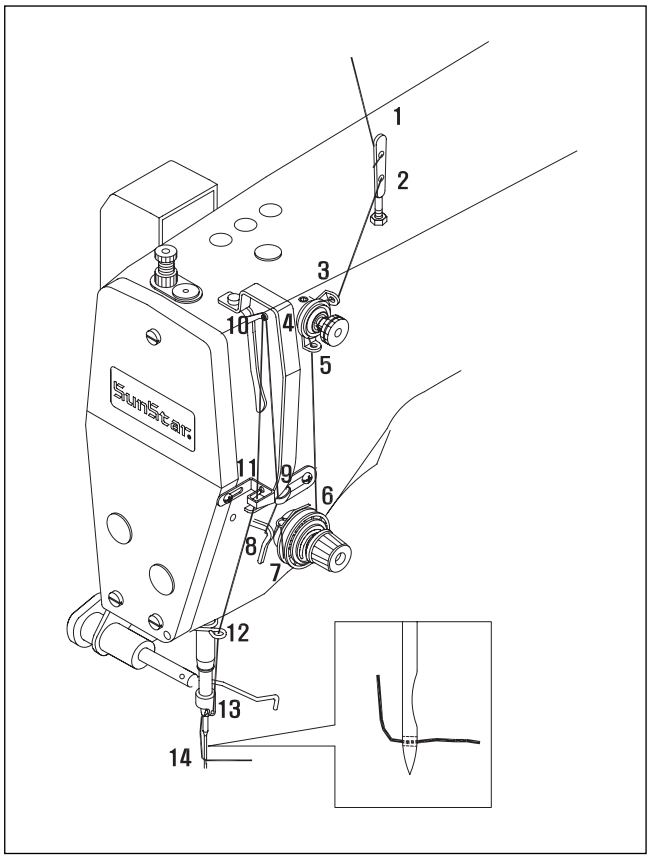
1. When the machine operation is normal, check the position of oil gauge② in the oil window①on the left of reverse lever.
2. It is normal that the upper part of oil gauge② is between two orange carved lines.
3. If the upper part of oil gauge② is under the lower carved line, supply lubricant by referring to "4-3 supplying oil."



[Figure 36]

7-1-3. Checking

1. When needle is deformed or the end of needle is damaged, change the needle.
2. Check if upper thread is inserted correctly. (Refer to 5-5 Inserting upper thread)
3. Run trial sewing.

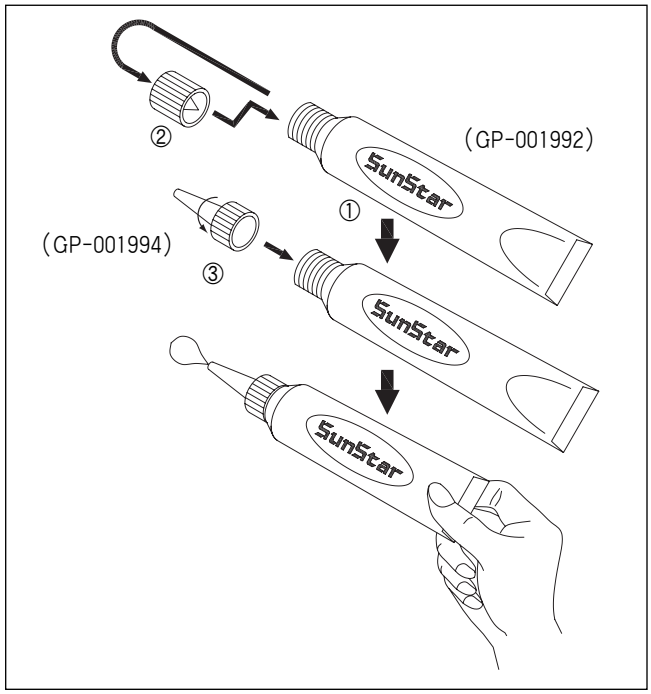


[Figure 37]

7-2. Supplying grease (KM-2300S□ & F□)

7-2-1. Supply grease

1. Only use the Sunstar's genuine grease enclosed in the accessory box. (Serial number : GP-001992)
2. Make a hole on the frontal tip of the grease tube by using the cap ② of the tube.
3. Attach the enclosed grease feeder firmly to the tube. (Serial number : GP-001994)
4. Apply the grease to the place where the grease needs to be applied.
5. If the grease is used up, only buy and use the Sunstar's genuine grease.



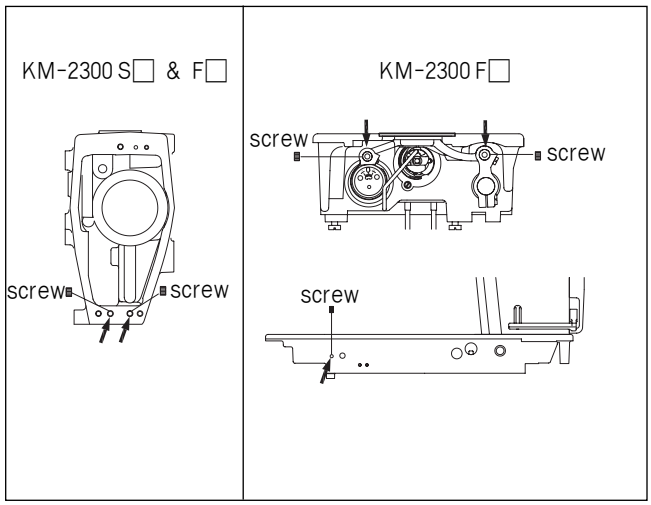
[Figure 38]

7-2-2. Greaging cycle

1. Supply grease every six month after set up the macine.

7-2-3. How to supply grease

1. Turn off the power.
2. Remove the screw.
3. Supply grease until grease goto over arrow mark.
4. Fasten the screws.
5. Turn polley 5~10 times by hand.
6. Wipe flowed grease.
7. Turn on the power and start sewing.



[Figure 39]

8

Maintenance and repair

[Caution]

- For machine maintenance and repair, consult with qualified technicians.
- For electrical maintenance and repair, consult with qualified technicians or agencies.
- When safety devices are disassembled, make sure to return them to original positions.
- Use both hands when bending the machine backwards or returning it to the original position. Using only one hand can lead to severe hand injuries due to the weight of the machine.
- Turn off the switch and pull the plug. Pressing pedal by mistake may result in physical injuries.
  - Inspection, maintenance, repair
  - Exchanging expendable parts such as needle, hook, knife.
  - Adjusting hook oil flow
- In case you operate the machine when the power is on, please take special precaution.

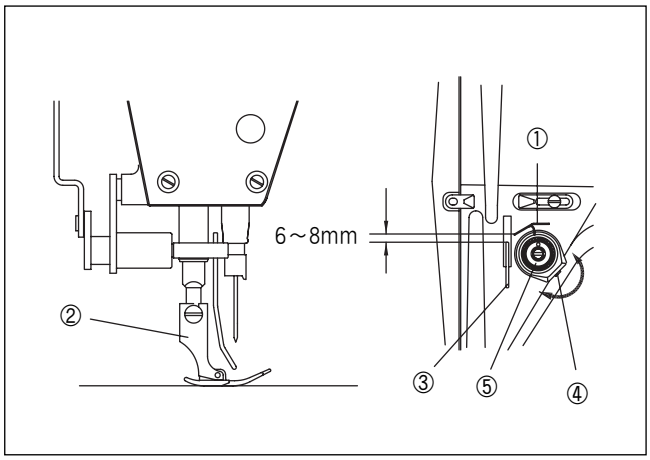
8-1. Adjusting thread take-up spring

8-1-1. Position of thread take-up spring

It is standard that thread take-up spring① is at the place where the spring's movement range is 6~8mm from the upper surface of thread routing plate③ with presser foot② descending. (□A and □G type)

(For □B and □H type, 4~6mm is standard)

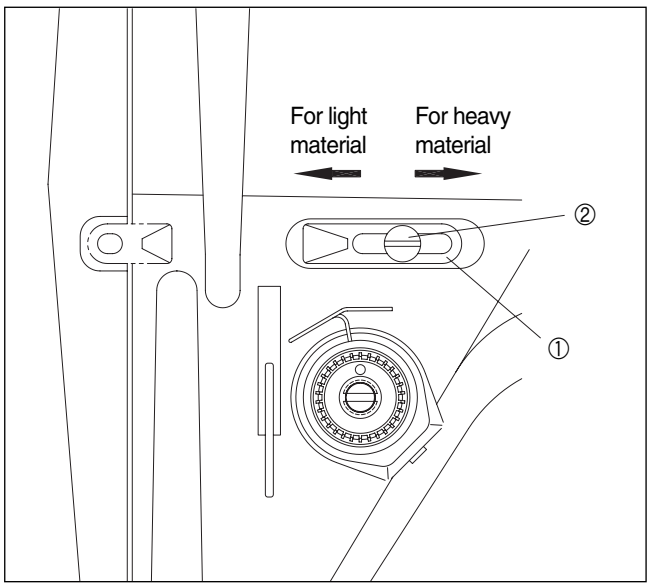
1. Lower presser foot②.
2. Loosen fixing screw④ lightly.
3. Adjusting position by turning thread control device⑤.
4. Fasten fixing screw④ tightly.



[Figure 40]

8-2. Adjusting right arm thread guide

1. It is standard that clamp screw② is placed at the center of long hole of right arm thread guide①.
2. Loosen clamp screw② and move right arm thread guide① both sides to adjust.
3. In case of heavy material sewing, move right arm thread guide① to the left. (The amount of thread in thread take-up will increase.)
4. In case of light material sewing, right arm thread guide① to the right. (The amount of thread in thread take-up will decrease.)

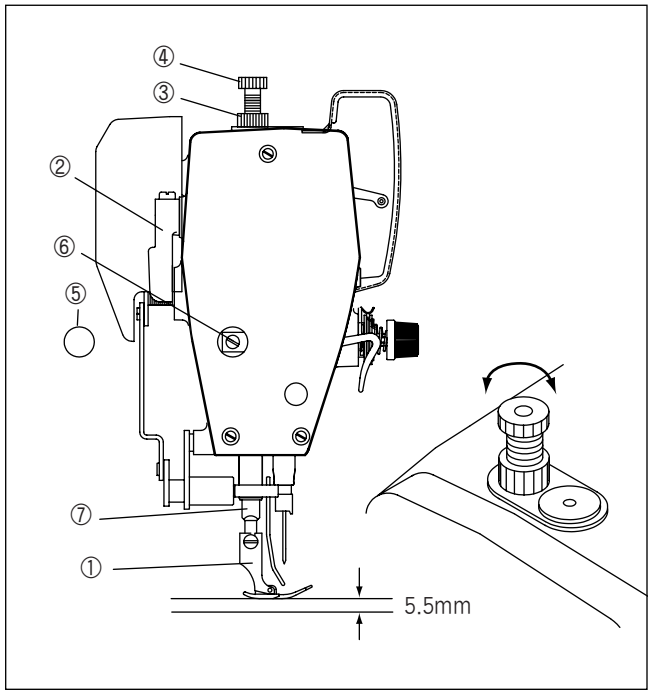


[Figure 41]

8-3. Adjusting presser foot height

· Standard height of presser foot is 5.5mm, when presser foot ① is raised by pressing bar lifter ②.

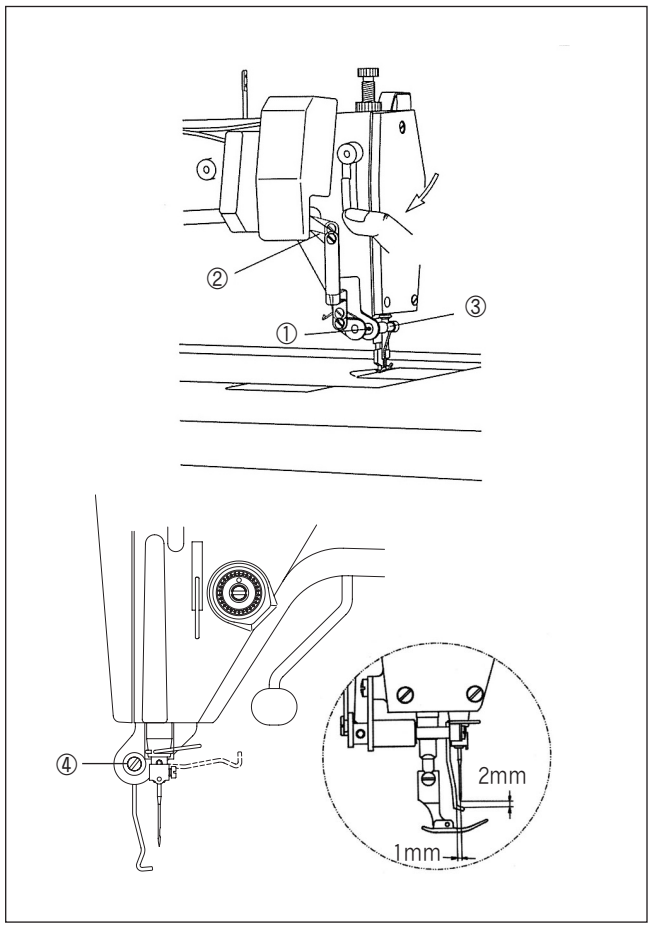
1. Put pressure on presser foot by loosening the nut ③ and unfastening pressure adjusting nut ④.
2. Raise presser foot ① with pressing bar lifter ②.
3. Disassemble rubber cap ⑤ on the side board.
4. Adjust presser foot at the height of 5.5mm by loosening bolt ⑥ a little and adjusting position of pressing bar ⑦.
5. Fasten the bolt ⑥.
6. Assemble the rubber cap ⑤.
7. Adjust presser foot pressure with pressure adjusting screw ④. Fasten the nut ③.



[Figure 42]

8-4. Adjusting wiper

1. Turn the pulley manually and stop turning when it reaches at highest position of the thread take up lever.
2. Loosen the two wiper shaft fixing screws① on the wiper base and press the connecting link② with the hand. Then adjust the wiper shaft③ so that the gap between the wiper and the needle is about 2mm and tighten the wiper shaft fixing screw①.
3. Next, loosen the wiper fixing screw④ and adjust wiper so that the gap between the lower end of the wiper and the end of the needle is about 2mm, after which the wiper fixing screw④ must be tightly fastened.

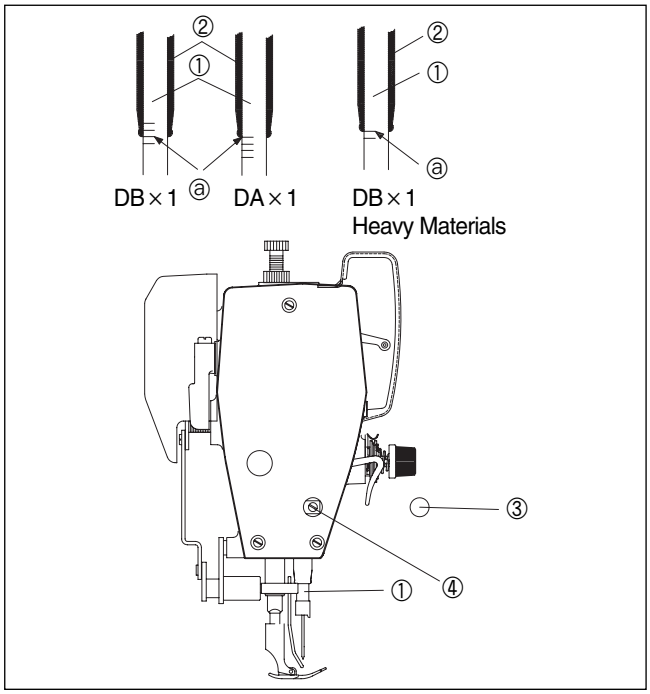


[Figure 43]

8-5. Adjusting needle bar height

· When needle bar① is placed at the lowest position, align carved line ⓐ of needle bar① with lower part of needle bar lower bushing②. (Be cautious of DA needle and DB needle position)

1. Turn pulley to put needle bar① at the lowest position.
2. Detach rubber cover③ on side-board.
3. Loosen clamp screw④ lightly to adjust needle bar①.
4. Fasten clamp screw④ tightly.
5. Install rubber cover③.

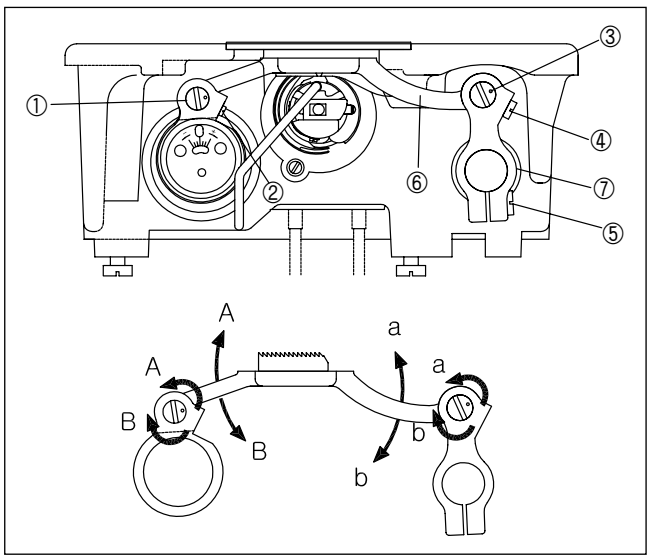


[Figure 44]

8-6. Adjusting height and slope of feed dog

· The maximum height of feed dog① from the upper surface of needle plate is 0.8mm(for KM-2300□A and □Gtype) and 1mm(for KM-2300□B and □H type)

1. Turn pulley to stop feed dog at the highest position.
2. Bend the machine backward.
3. Loosen fixing screw② and fixing screw④ lightly.
4. Adjust feed dog height and slope by turning lifter crank eccentric shaft① and eccentric shaft③ of feed dog bed crank.
5. Refer to the right side figure to see movement direction of feed dog bed⑥ according to rotation direction of each eccentric shaft.
6. After finishing adjustment, fasten fixing screws② and ④ by pushing eccentric shafts ① and ③ to the direction of shaft.



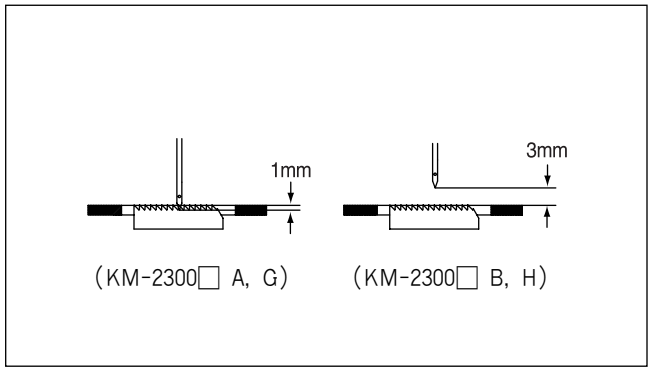
[Figure 45]

[Caution]

1. When feed dog slope is adjusted only with one eccentric shaft, height of feed dog will change. Therefore make sure to adjust two eccentric shaft.
2. Moving position of feed dog may change according to eccentric shaft adjusting position. In this case, adjust moving position of feed dog after loosening fixing screw⑤ of feed dog bed crank⑦.

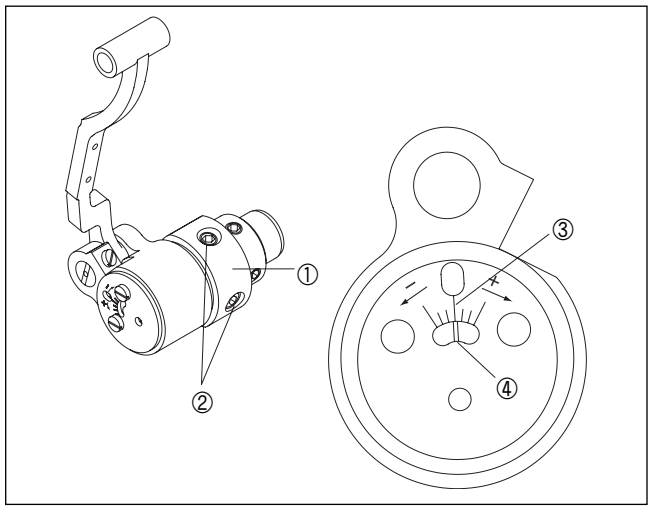
8-7. Needle and conveying timing

- Lower the feed dog ① from its highest position by turning the pulley. It is standard that the needle tip is positioned as in the figure, when feed dog is aligned with surface of the needle plate ②.
  (KM-2300□A and□G)
- The two surfaces of feed dog ① and needle plate ② are aligned with each other. The needle tip is about 1mm down from the needle plate ②. (KM-2300□B and □H)
- The two surfaces of feed dog ① and needle plate ② are aligned with each other. The distance between the needle tip and the surface of needle plate ② is about 3mm.



[Figure 46]

- Change in lifter cam stop position makes it possible to adjust conveying timing.
  1. Bend the machine body backward.
  2. Unfasten a little the two fixing screws ② of the lifter cam ①.
  3. Adjust the conveying timing by turning left and right the lifter cam ①.
  4. The standard timing is when lifter shaft carved line ④ is aligned with the middle line on the bearing cover carved line③.
  5. Turning the lifter cam ① in the direction of (+) will make conveying timing fast. (It is generally used to prevent puckering.)
  6. Turning the lifter cam ① in the direction of (-) will make conveying timing slow. (It is generally used to enhance the thread tightening.)

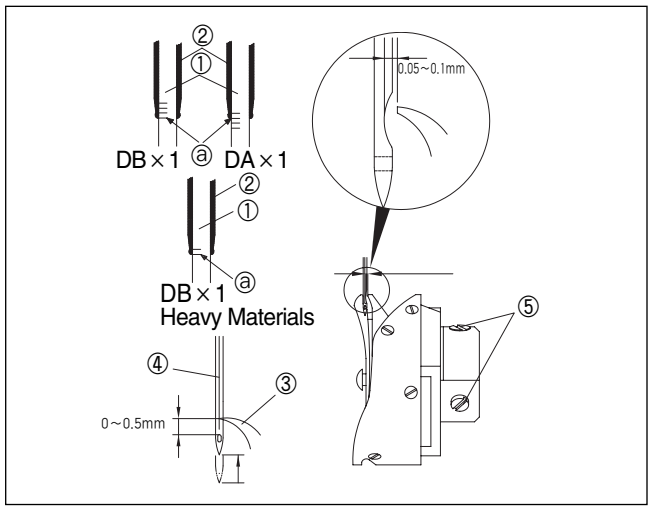


[Figure 47]

[Caution] Too slow conveying timing can cause needle break.

8-8. Needle and hook timing

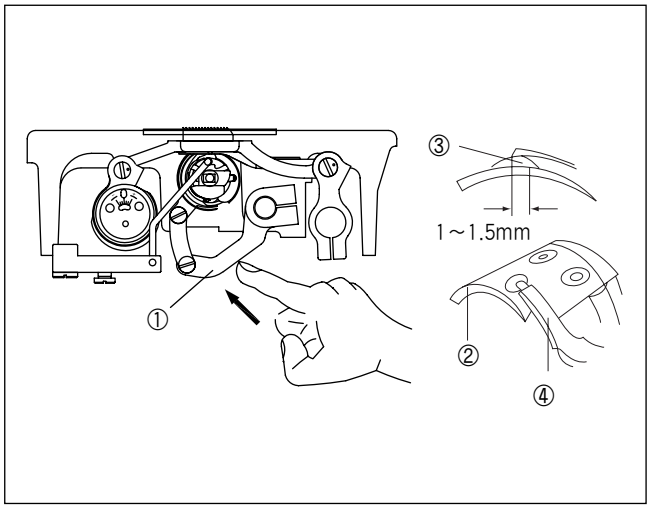
1. Raise the needle bar ① from its lowest position by turning the machine pulley. As in the figure, align carved line ⓐ with the lower part of needle bar down-bushing ② and adjust the distance between the upper part of needle hole and the hook edge at 0 ~ 0.5mm.
2. Loosen three fixing screws ⑤ and align the hook edge ③ with the center of needle ④. Keep the hook edge ③ 0.05 ~ 0.1mm away from the needle ④.
3. Fasten three fixing screws ⑤ completely.



[Figure 48]

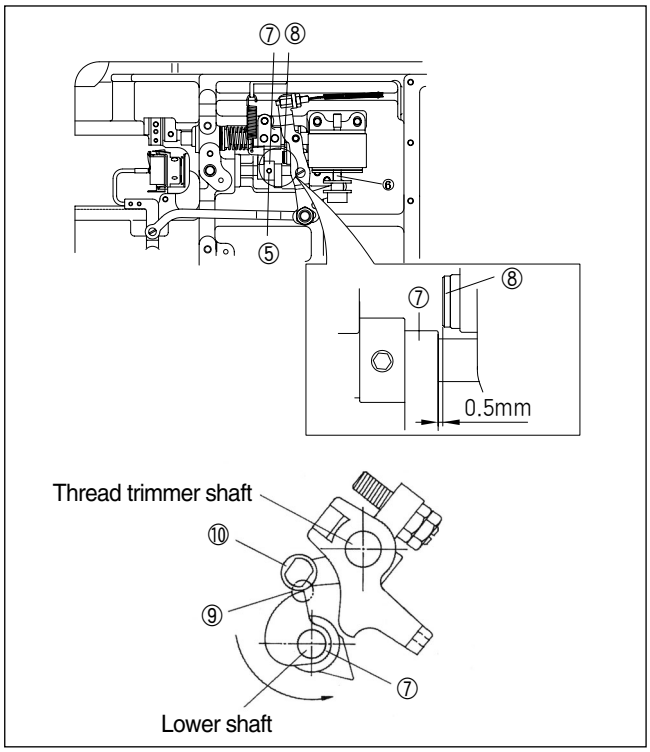
8-9. Adjusting trimming time

1. Turn pulley to raise needle bar by 10~20° from the lowest position.
2. Push the trimming lever① so that the thread trimming knife ③ on the hill of the movable knife② is about 1~1.5mm more protruded than the end of the fixed knife④.



[Figure 49]

3. Push the trimming solenoid shaft⑥ manually while the trimming cam fixing screw⑤ is loose.(At this point, the appropriate distance between the initial trimming cam⑦ and the roller single screw⑧ is 0.5mm.)
4. Turn the trimming cam⑦ manually so that the edge⑨ of the roller driving part on the trimming cam⑦ touches the roller ⑩. Then tighten the trimming cam fixing screw⑤.
5. Connect the return spring.

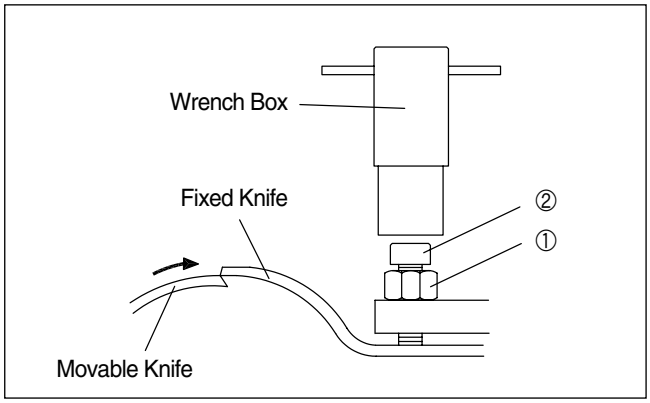


[Figure 50]

8-10. Adjusting and replacing knife

8-10-1. Adjusting fixed knife

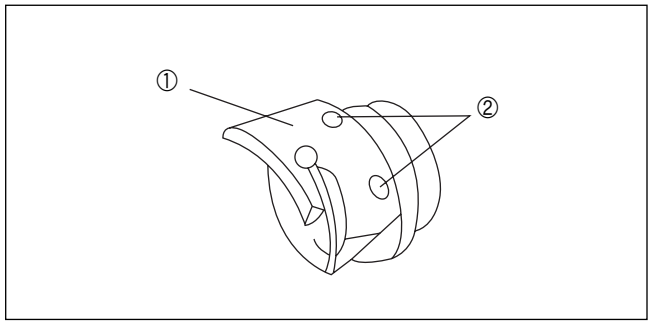
1. First, loosen the fixed knife tension adjusting nut① with a wrench box and then loosen the tension adjusting screw②.
2. Adjust the tension adjusting screw of the fixed knife when the movable knife-edge meets the fixed knife-edge.
3. Adjust knives so that the knife edges meet without too much tension.
4. After adjustment, make sure to tighten the tension adjusting nut① using the wrench box in the accessory box.



[Figure 51]

8-10-2. Replacing movable knife

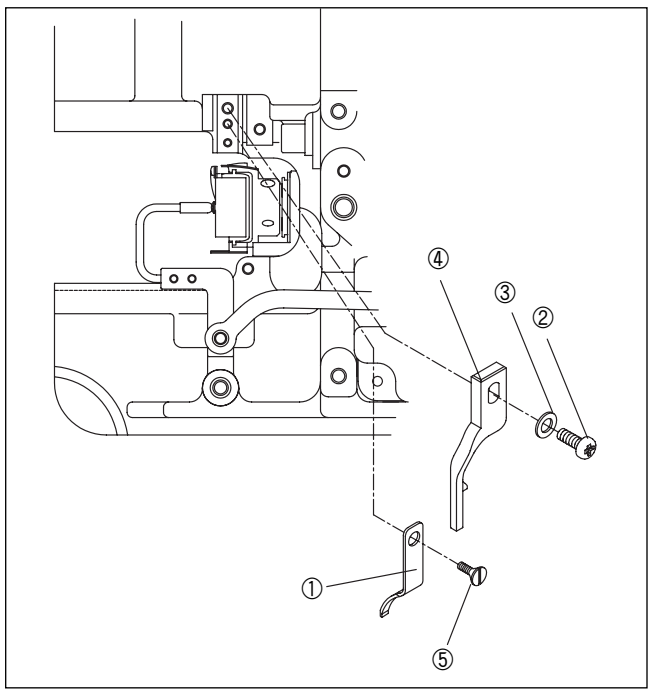
1. To replace the movable knife①, turn the pulley manually to place the needle at the highest position.
2. Unscrew two moveable knife fixing screws② and remove them as shown in Fig. 52.
3. Follow these instructions in reverse order to assemble.



[Figure 52]

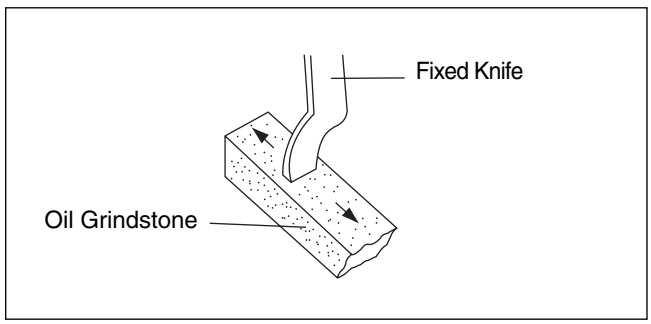
8-10-3. Replacing fixed knife

1. To replace the fixed knife①, loosen the hook holder fixing screw② as in Fig. 53, remove the washer③ and hook holder ④, and then unfasten the fixed knife fixing screw⑤.
2. Follow these instructions in reverse order to assemble.



[Figure 53]

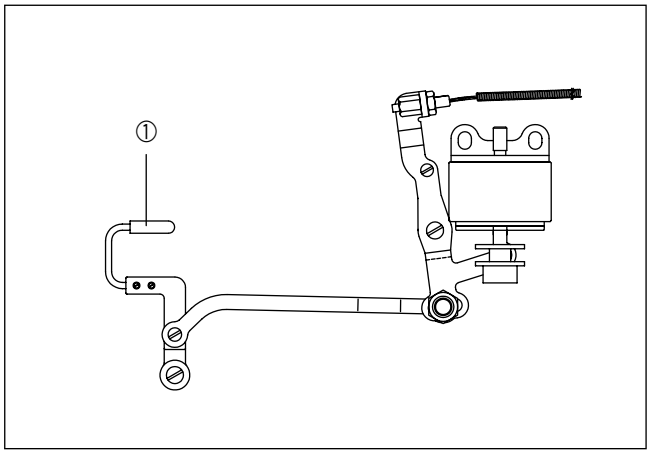
3. If the edge of the fixed knife is worn, make sure to grind the knife edge with an oil grindstone as shown in Fig. 54.



[Figure 54]

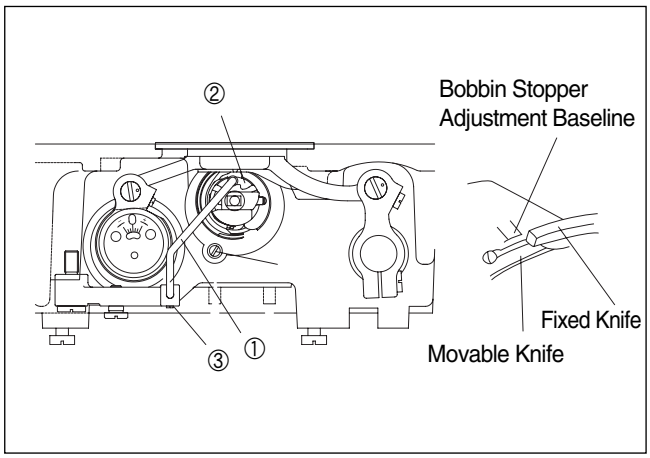
8-11. Adjusting bobbin stopper

1. If bobbin stopper① is inserted too deeply into bobbin case, lower remaining thread will be so short that bobbin cannot rotate. As a result, sewing may not be created in the next sewing.
2. On the contrary, if bobbin stopper① is not inserted enough, upper thread will missed from bobbin stopper during trimming and the length of remaining thread in needle will be short. As a result, sewing may not be created in the next sewing.



[Figure 55]

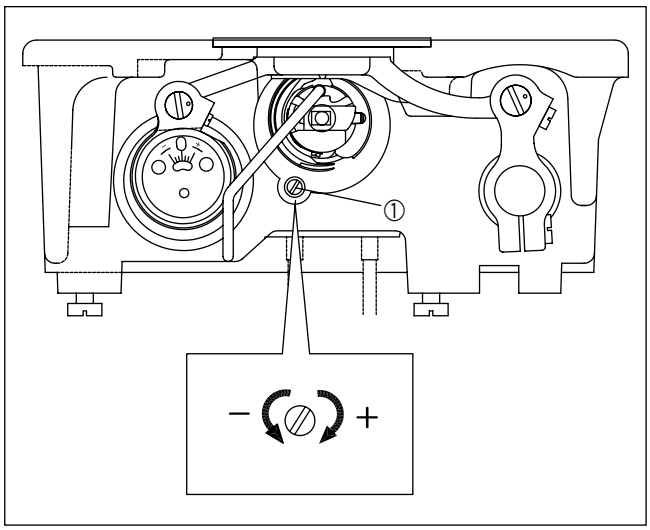
3. If the trimming was done manually, stop the machine when the edge of the fixed knife meets the bobbin stopper adjustment baseline that is marked on the top. Loosen the bobbin catcher fixing screw③ and adjust the bobbin stopper so that the contact surface of the bobbin stopper① lightly touches the center of the projecting part of the bobbin②. Once the operation is completed, check to see whether the bobbin stopper springs back lightly.



[Figure 56]

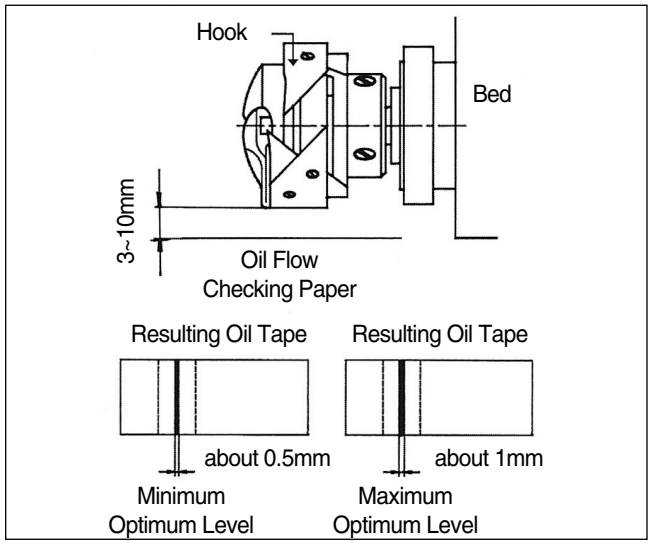
8-12. Adjusting oil flow in hook (KM-2300M□ & S□type)

1. Bend the machine body backward.
2. If oil amount adjusting screw① is turned clockwise (in direction of+), the amount of oil supplied to hook will increase.
3. If oil amount adjusting screw① is turned counterclockwise (in direction of-), the amount of oil supplied to hook will decrease.



[Figure 57]

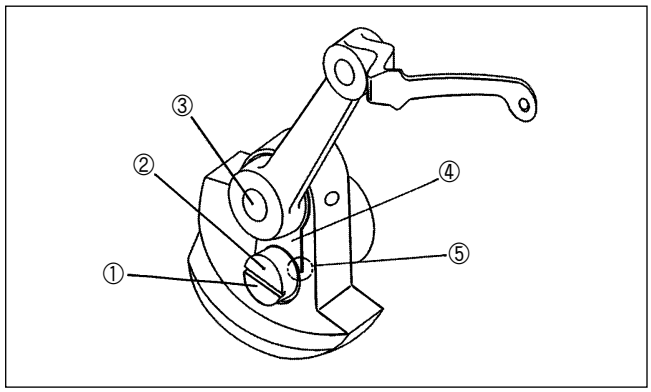
4. After turning idly the sewing machine for three minutes (at an appropriate speed), secure the oil flow checking paper as shown in Fig. 58 and run the machine for about five seconds. Then check the oil tape marked on the paper.
5. Check the oil supply level three times. The appropriate level of oil is when the oil level neither exceeds the maximum amount nor falls below the minimum level. (Insufficient oil would jam the hook, whereas excessive oil would contaminate the sewing material with oil.)



[Figure 58]

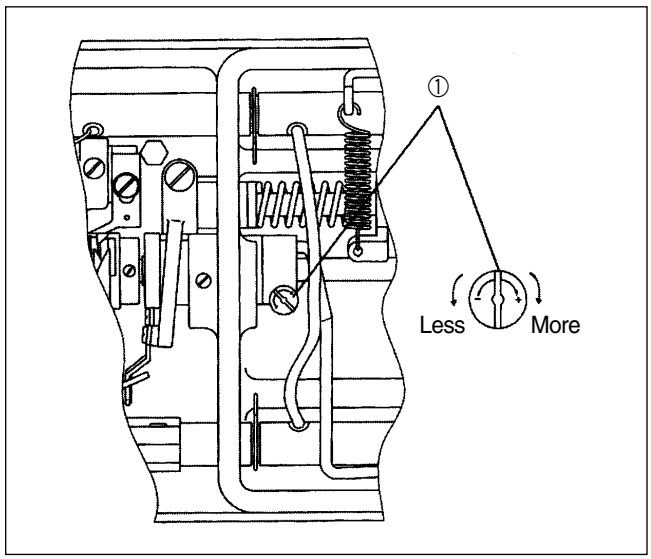
8-13. Oil Supply Adjustment (KM-2310 Series)

1. Adjusting oil supply to thread take-up lever
   1) As in the figure, when the punched mark② on the oil volume adjusting pin head ① is aligned with the hole of the needle bar crank③, the oil supply volume will become maximum. As the oil volume adjusting pin ① is turned left or right and becomes closer to the edge⑤ of the crank cam plate④, the oil supply volume grows smaller.
   When the punched mark passes the edge ⑤ of the crank cam plate, no oil will be supplied.



[Figure 59]

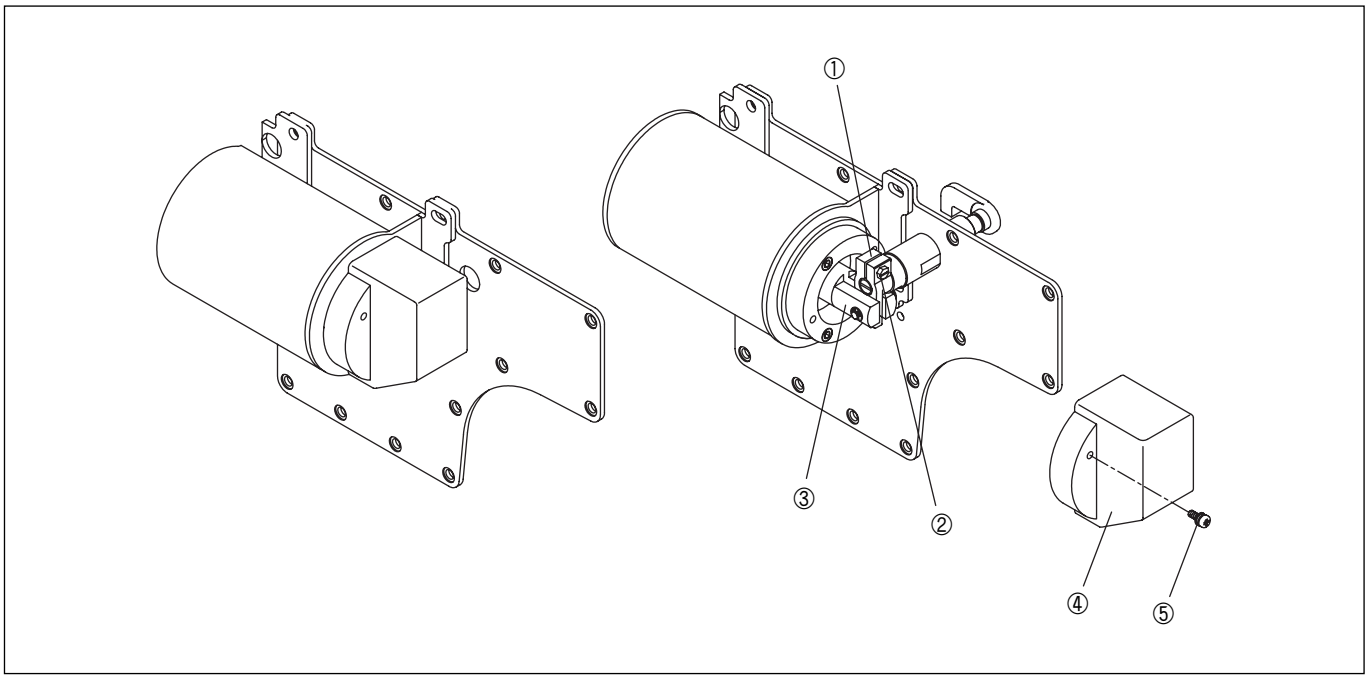
2. Adjusting oil supply to hook
   1) As in the figure, turn clockwise (+) the oil volume adjusting screw①, which is inserted into the low-axis front bushing, and the oil supply will increase. If the oil volume adjusting screw is turned counter-clockwise (−), the oil volume will decrease.



[Figure 60]

8-14. Adjusting automatic knee lifter (Option device)

1. An automatic knee-lifter will be attached to the sewing machine upon shipment.
2. The lifting amount of the presser foot when automatically lifting the knee is controlled by the automatic knee-lifting solenoid shaft crank①.
3. First, loosen the solenoid cover fixing screw⑤ and remove the solenoid cover④.
4. If the solenoid shaft③ is moved left and the fixing screw② is tightened when the solenoid crank shaft fixing screw② is loose, the lifting amount of the presser foot grows smaller; and if it is moved right and the fixing screw is tightened, the lifting amount of the presser foot grows bigger.
5. Assemble the cover back after the adjustment is completed. (The presser foot lifting amount for the automatic knee-lifter is set at 15mm by default upon shipment.)



[Figure 61]

9

Causes of troubles and troubleshooting

1) Sewing machine troubleshooting

No	Symptom	Checkpoints	Root cause	Corrective action
1	Needle breaks	Direction and height of needle	Needle is inserted into wrong direction.	Reinsert the needle correctly.
		Needle	Needle is bent.	Replace the needle.
			Bad timing of feed dog.	Adjust the timing of feed dog.
		Ascending level of needle bar	Bad timing of needle and hook.	Adjust the timing of needle and hook.
		Height of needle	Bad timing of needle and hook.	Adjust the timing of needle and hook.
		Gap between needle and hook	Bad timing of needle and hook.	Adjust the timing of needle and hook.
2	Thread breaks	Threading method	Wrong threading.	Thread the needle correctly.
		Needle	Bent needle or broken needle tip.	Replace the needle.
		Direction and height of needle	Needle inserted in the wrong position.	Insert the needle correctly.
		Upper thread tension	Too tight upper thread tension.	Reduce tension of upper thread.
		Lower thread tension	Too tight lower thread tension.	Reduce tension of lower thread.
		Working capacity of take-up lever spring	Loose upper thread.	Adjust take-up lever spring.
3	Stitch skips	Direction and height of needle	Needle inserted in the wrong position.	Reinsert the needle in the right direction.
		Needle	Bent needle or broken needle tip.	Replace the needle.
		Threading	Thread passing at wrong position.	Replace the needle.
		Ascending level of needle bar	Wrong timing of needle and hook.	Adjust the timing of needle and hook.
		Height of needle bar	Wrong timing of needle and hook.	Adjust the timing of needle and hook.
		Gap between needle and hook	Wrong timing of needle and hook.	Adjust the timing of needle and hook.
			Remaining length of upper thread is short .	Adjust the thread adjusting device.
		Racing-proof spring of bobbin case	Due to bobbin racing during trimming, lower thread dropping from bobbin case becomes too short to go up.	Replace the racing protection spring.
		Take-up lever spring	Unable to lift lower thread due to weak take-up lever spring.	Adjust the working capacity of take-up lever spring.

No	Symptom	Checkpoints	Root cause	Corrective action
4	Upper thread does not sink.		Too tight upper thread tension.	Reduce tension of upper thread.
			Too loose lower thread tension.	Increase tension of lower thread.
5	Lower thread does not sink.		Too weak upper thread tension.	Increase upper thread tension.
			Too strong lower thread tension.	Decrease tension of lower thread.
6	Trimming errors	Tension of fixed blade	Tension not aligned between movable and fixed blades.	Adjust tension of movable and fixed blade.
		Edge of movable and fixed blades	Abrasion in blade groove of movable and fixed blades.	Replace movable and fixed blades.
		Direction of needle	Wrong needle insertion.	Reinsert the needle correctly.
		Check the crossing of trimmer cam notch mark and blade	Insufficient crossing quantity of movable and fixed blade.	Adjust the strokes of movable and fixed blades.
7	Upper thread is pulled out when sewing commences.		Too strong upper thread tension.	Adjust tension of upper thread.
			Too thick a needle for thread.	Check thickness of needle.
		Check the Up-stop position of needle	Take-up lever pulls out the upper thread because the needle up and down position is too high.	Adjust the up-stop position of needle.